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by

Mr. Floyd King
Peanut Industry Representative
Agricultural Council of America

Thank you, Jack, for such a marvelous introduction. It is gratifying to hear such nice things about anyone - but to hear and understand that these words were spoken of you or me - I think any one of us would be inclined to go into politics or something upon hearing these things. Even President Carter would appreciate a compliment like this. Again, Jack, you are very kind!

I must say I had three speeches and all different which I would have enjoyed giving today - but I have decided to go ahead with one that I think no one can dispute or argue with.

America has always been a land abundant in natural resources and wealth. From the time of our birth as a nation, the ingenuity of our people and availability of all we needed from the storehouse of nature ha allowed us to become the greatest nation on earth. Because of this combination of human and natural resources, we have always been able to develop the industrial needs and to fill the requirements of each succeeding level of progress long before it was needed; and as the world became more complex, our ability to trade around the world for what we needed to fuel our progress has never failed. These unique assets, and our great democratic republic, allowed us to come, in a few short decades, from the horse and buggy to the space shuttle - from the log cabin to the home filled with convenience - from the pony express to satellite communications - and from the kerosene lantern and wood fire to the electric light and a society filled with appliances to serve our every need, including a more than bountiful supply of food and fiber for our tables.

Then came 1973 - all of a sudden, without warning, and for no apparent reason, we were short on energy - we had a crisis. Our economy, our society, and our ultimate survival as a nation were threatened. Prices started climbing, inflation ravaged our land, and uncertainty permeated our future. Politicians shouted blame at each other. Everyone began looking for someone or something to blame. Now, some six years later, we seem to know less about what happened, and our future seems even more uncertain than ever. The politicians are still shouting. The situation worsens daily. We can count on double-digit inflation, unemployment, recession, and a severe jolt to our lifestyle.

So, today, in 1979, we ask ourselves once again, what is the problem? Where have we gone astray? What can we do? Obviously, there is no single answer to any of these questions. There are numerous reason for the dilemma, and it will require numerous actions to solve the problem.

Some policies have, today, resulted in severe domestic shortages, and frightening dependence on imports. Russia - Iran - Horn of Africa, African continent - Salt II - Defense forces - all of these are trouble spots, but they are another subject and speech - maybe someday - somewhere.

Then in the 1960's enter those saviors of the coyotes and the snail darters, the environmentalists. At that same time, the consumer was discovered, and Ralph Nader crowned himself emperor of all he surveyed - proclaimed himself an expert in everything from coyotes to nuclear energy, and the politicians started cranking out laws by the thousands. The bureaucracy responded with regulations by the millions. Costs started rising, inflation accelerated, businesses disappeared - we were stampeded toward saving us from ourselves. EPA, OSHA, and the Federal Trade Commission flourished, unemployment rose, and cities declined.

Today, the concentration of those mistakes has caused our dilemma. Unrealistic government control, personal greed, radical influence of policy, and now OPEC domination and oil company manipulation to some degree have forces our backs to the wall.

These remarks are not my speech. As bad as conditions are - I think still exists today a parallel of this in the agricultural business field. This parallel is the tremendous void or gap between agricultural and the urban society. We have cried - begged - pleaded - politicked and literally screamed - "Let us in Agriculture just have a fair shake". To Congress we said: "Pass a farm bill which will help to elevate the farmer above the lower level of economic stature."

An organization is now in existence which could very well help close this void with the help of you and me and the millions of people to whom the message is directed - the name is A.C.A. May I tell you of it?

The Agricultural Council of America, in cooperation with the Texas A & M University and the great help of Dr. Jarvis Miller, who is the president of that University, last summer arranged for and helped with what was called the Farm Summit. At this particular meeting every segment of agriculture was invited - or, I should say, each segment of agriculture was invited. The wheat people were there as well as the cotton-cattle, - peanut, and other commodity groups representations. The A.C.A. does not promote one program over another buy rather serves as the forum for discussing these complex problems and assists in finding the solution for them.

The F.O.R. program, which means Forum On Regulations, has been a program under the A.C.A. for over a year now - and would you believe that we have found out that the regulations for one year duration and cost of the paper work during that period reaches a giant 4 billion dollars.

What we call "Washington on the Line" is one of our programs. For example, if you have a group of people like we have today, we could have Secretary of Agriculture Bergland on the telephone answering questions which might come from anywhere in the United States. At one of the last sessions, there were over 3 thousand phone calls received and well over that attempted.

I believe you will find that the subject of an over-abundance of regulations competes very well with even inflation as a topic for very serious scrutiny, and an effort to change this part of Congress especially and the federal bureaucracy should be made. So much of the time one program is written which might require 10 pages of documentation, but putting that particular law in force might take 50 to 500 pages of regulations. And, in many cases, these regulations are written so that the effect of them is to change the intent of Congress in the writing of the bill in the first place.

The "Heart Beat" program, which is going on now, is a program that has as one of its goals one thousand new members of A.C.A. To become a member of A.C.A., you simply have to contribute to it and support its efforts. The money which is received by A.C.A. which allows it to function and allows A.C.A. to sponsor and to perform different type programs throughout the year is funded by agricultural people and agricultural business people, but anyone can join and contribute. For instance, the John Deere Corporation has one representative, Dow Chemicals has one, Farmland Industries has one, the National Peanut Growers has one (which is the position I am attempting to serve) and many other agricultural business firms have a representative on A.C.A. There were 264 Congressmen who helped to sponsor the F.O.R. program last year. A.C.A. operates on a 500 thousand to 3/4 million dollar budget. The programs which A.C.A. sponsors are not meant to overshadow or duplicate commodity groups' lobbying efforts for farm programs, but are meant to add to Agricultural influence and to bring the Agricultural Business Group into the fold to help close the gap and void.

A.C.A. does even now plan a unity day for agriculture and also to investigate the Huge Decision Making Process in an effort to determine if there could be some changes which would make a better way. This does not necessarily mean that an upheaval of Congress or the Senate would be recommended but rather some changes might improve the methods in which we write laws what we call an Ad Hoc Committee which recommends issues to be taken up by A.C.A.

A major conclusion: The farm problem has changed, therefore, the solutions to the problems also must change. Finding these solutions will mean the continuation of the constructive dialogue. When problems exist - progress is possible. When communication is stopped - progress stops. The spirit of cooperation must absolutely continue, and you and I have a responsibility to promote it.

I have never been prouder of Agriculture than I am today. How about you? Let's do our share to promote it. It's your lifestyle; make it better!

ADDRESS

by

The Honorable Spencer Bernard

Lieutenant Governor, State of Oklahoma

I have a picture on the wall of my office that I am most proud of. It is a picture of me on my first job, with four mules, I started out farming in the early thirties with four mules and walking tools.

In the middle thirties, tractor farming emerged. Then, in the late thirties and early forties, because of the war, great emphasis was put on the need for additional agricultural products, and especially peanuts.

So, along with my neighbors, I planted my first peanuts. In those days, peanuts were planted in the hull, not shelled as today with seed treatment on the kernels to help germination. Planting the seed in the hull made it a slow process for germination, because moisture had to penetrate that hull before the process of germination could start. Also, we had no pre-emerge chemicals for grass and weed control. And many times the grass and weeds would come up before the peanuts would and that made control of vegetation without damage to the peanuts very difficult.

Come harvest time, much of the harvest was done by hand at that time, even to pulling up the plants and stacking them in piles or around a stack like hay. The peanuts remained there until they were dry.

The first year when we planted peanuts. when it neared harvest time, we all realized there was no harvest equipment in our community. I had an almost new grain threshing machine and my neighbors prevailed on me to try to convert the machine into a peanut thresher.

I made a trip to the peanut country in Texas, where peanuts had been grown for years. I got what information was available from farmers and blacksmiths on converting a grain thresher to a peanut thresher and returned home and started work.

It proved that my efforts worked and we started a neighborhood crew. If the peanuts were in piles in the fields, we used bundle wagons and threshed those first, because of the exposure. But if they were in stacks like hay, we waited and pulled the thresher in close and forked the peanut vines in.

The weather was not a serious problem if the peanuts were in stacks, because they had some protection. Because of the urgency of time, we threshed peanuts in the rain, in the snow and ice, and in below freezing weather, for seven days a week, 12 to 16 hours a day, for four hard, long months.

When the last stack was threshed, and I pulled the machine home, I was so weather beaten and physically worn out, I felt like I never wanted to see another peanut. But, of course, it was necessary to continue this type of harvest for a few years until the combines began to take over the harvest. Was I glad to park that old machine.

One day a man by the name of Pat Cagle, from the Durham Peanut Company of Texas, came by and asked me if I would be interested in starting a peanut buying operation at Rush Springs. The Texas crop was bad that year and he had contracts to fill and no peanuts. He was to finance the total operation and I was to do the rest.

There was a long-time, established buyer in Rush Springs, by the name of Brown. I could see, that getting into competition with him, that it was going to be tough to get any peanuts. He had been buying the farmers' crops for years.

Mr. Cagle told me not to pay any more than necessary, but to pay enough to buy the peanuts. I borrowed the use of a truck scale which was across the street from my competitor. When harvest started, and the first load of peanuts arrived in town, the peanut grader would first run a grade on a sample from the load, so the buyer and the farmer could see what he had. I told the farmer not to sell until I had a chance to bid on the load.

He first went to Mr. Brown and Mr. Brown gave him a price based on the grade sheet. The farmer then crossed the street to my place and handed me the grade sheet for my bid. I looked at the grade, as if I knew what all of it meant, which I didn't, but I acted like I had some expertise on peanuts. I told the farmer that he had some good peanuts and raised the bid he had by $2.00 per ton.

The farmer said, "Well you bought the load." I then told the farmer, to be fair to the other buyer, he should give him a chance to raise my bid. But I explained, if he did raise me, not to sell to him until I had another shot at the load.

The farmer crossed the street and Mr. Brown raised my bid by $2.00 per ton. The farmer came back. I looked the grade sheet over again, and remarked, "Those are the best peanuts I have looked at this year." It was true, it was the only load I had looked at!

I raised the bid another $2.00, then sent the farmer back across the street. The farmer said, "If you fellows got the money, I got the time." This went on for some ten trips before my competitor got cold feet. Then I bought the load.

For a new business, I could not have bought that kind of advertising at any price. The farmer told it to everyone and every farmer came to see me for a bid on his peanuts.

My competitor was prone to indulge at times. So, every time I bought a load of peanuts, he would buy a pint of liquor. I didn't buy all the peanuts, but I bought most of them.

Mr. Cagle in Texas was happy, I was happy and Mr. Brown was happy, at least after 10:00 each morning.

The next year Mr. Brown was ready to sell out and I bought his scale and warehouse. Then I had a place of my own. Later, it was apparent that a peanut dryer was badly needed. Field drying was difficult and delaying. With machine drying, exposure to the weather was eliminated.

So, I designed and built a drying tunnel and then built drying wagons for attachment to the tunnel. This of course, made it possible for the farmers to bring their peanuts to market as soon as they harvested them.

Those four wagon dryers appeared to me and to the other farmers, to be a large drying operation. The farmers were still bagging their peanuts. There were no bulk combines, just sack combines. But, the farmers were bagging them with 20 to 35 percent moisture in the kernels. We placed them in the wagon in the bags to dry, and it worked.

But, the farmers brought the harvest in faster than those four wagons could dry them, which resulted in waiting lines. The next year I added four more wagons. But I also came up with a new brainstorm on a new buying process.

The old process had been to dry the farmers peanuts and then buy them. This required each farmers peanuts to be kept identified and separate until dry. If the farmer's peanuts did not fill a wagon, then we dryed a half of a load or whatever was in the wagon. This was leaving the other half of the wagon as lost capacity.

So, I decided if we could determine the moisture content as the peanuts came in to market, we could deduct that weight that would be dried out of the peanuts. That way we could buy them green before drying. We could utilize all the wagon space by filling each wagon full regardless of whose peanuts they were. This way too, we could empty the bags in the wagon and dry bulk peanuts and handle them with conveyors with less labor. We tried this method and it worked. I became the first buying point in Oklahoma to use that process and only one of two to ever use it.

However, complications developed. The farmers brought peanuts in so fast, that waiting lines were very long. So, since the peanuts were bagged, and to help the farmer, we graded the peanuts on the farmers vehicle and just stacked the peanuts on a vacant lot that I had nearby. We had the grade, and we had the weight of the load under the new system, so we could pay the farmer.

Thinking cloudy days would come and combining would be delayed, and we could empty the bags off the lot into wagons on those days and catch-up, we stacked on the ground every day more peanuts and we were still looking for cloudy days. Before I hardly knew it, I had half a million dollars of peanuts stacked out and paid for on that lot.

Those cloudy days came all right. And when they did, it was not just cloudy days, it was rain and more rain. For two full weeks it rained. Those peanuts instead of getting dryer, of course, got wetter and wetter. They began to heat and smoke and with the heat and moisture in the bag, it was ideal circumstance for sprouting. The sprouts began to show through the bags. The top of the bags were as green as your lawn with sprouts.

I began to have trouble sleeping and eating from worrying about my peanuts. We dryed day and night right on through the rain, slopping around in the mud loading those peanuts in the drying wagons. The sun finally did show, and

it was not as bad as it had appeared. Only a thin layer on the top and side of those bags had sprouted. After four trying weeks and just before a hard freeze, we caught up on the drying.

This is how I started as a peanut producer and this is how I started as a peanut buyer. Today, my plant has a drying capacity of 500 tons at one loading. Peanut handling is now all bulk, both by the farmer and the buyer unless bagged for seed. But the long waiting lines still exist because farmers are buying more harvest machinery. In the early days, 25 bushels per acre was considered a good yield. Today less than 100 bushels per acre is almost a failure in irrigated peanuts. Progress made by the research of your association has played a very significant role in the achievements made by peanut producers and processors in this country.

In 1966, I was elected without opposition to the House of Representatives and later assumed the office of Speaker Pro Tempore. Four years ago, my wife and I went on a vacation to the Micronesia Islands. While there, we decided to fly to Taiwan and visit some Chinese who we had met and made friends with while they were in the U.S.

Being gone some two weeks from the United States, I was completely unaware of, then President Ford, landing in Peking or Red China, on the same day we were landing in Taiwan. They were rolling out the red carpet for the President with much pomp and ceremony, as they should any President. The Republic of China on Taiwan wanted to show the United States that they were our real friends, not Red China.

So, they were looking for someone to roll the red carpet for as Peking was doing and it just happened that I was the only U.S. Official arriving in Taiwan at the time.

As I was leaving to return home, the Deputy Foreign Minister told me he would like to extend to me an official invitation to return next year and invite some other state leaders to come also. When I returned home, I invited Governor Boren, Lt. Governor Nigh and Speaker Willis. We could not all leave the state at the same time, so Governor Boren went at a different time. Lt. Governor Nigh, Speaker Willis and myself went together.

Then, the following year, 1977, they invited me and my wife once again for an official visit. As a result of these visits and contacts, the Chinese started procurement missions to Oklahoma for purchasing of grain and other products. Governor Nigh and myself, last year, signed contracts on two different occasions at the state capitol with the Chinese.

Early this year Governor Nigh appointed me, as Lt. Governor, to coordinate the export program for Oklahoma. I will be returning to the capitol immediately after my part here on your program, to sign the third contract for grain and machinery with the Chinese. They are there now opening the bids to see who the contracts are awarded to. This contract is for 20 million dollars of Oklahoma products.

The Chinese officials, at a meeting in California last month, told me that they plan over the next five years to do 10 billion dollars of foreign trade with the United States, and go all out to balance the two countries trade. I told them in Oklahoma we would only expect half of that.

They are already the 8th economic power in the world doing business with the U.S. Their country is one-fifth the size of Oklahoma, with 17 million people and they are a cash customer. I have been meeting with a number of officials from other nations on foreign trade, and I feel like we are on the verge of greatly expanding Oklahoma exports. I commend your association for the work you are doing for the peanut industry.

Effects of Genotype, Digging Date and Grade on the Blanchability of Virginia Type Peanuts. R. Walton Mozingo. Virginia Polytechnic Institute and State University, Tidewater Research Center, Suffolk, Virginia 23437.

ABSTRACT

Blanchability of Virginia type peanuts (Arachis hypogaea L.) is an important quality measurement to the peanut industry. The effects of genotype, digging date and market grade on blanchability were determined using eight genotypes (Florigiant, NC 17921, NC 17922, GK 42-910, NC 17976, NC 17404, NC 17977 and NC 77-7), two digging dates (early and late) and two grades (extra large and medium) at three locations. Four quality traits (% whole blanched kernels, % not blanched, % splits blanched and % partially blanched) were used to measure blanchability.

Significant genotypic differences were recorded for all traits measuring blanchability at all locations. Late digging resulted in a higher percentage of whole blanched kernels than the early digging at two locations; however, the reverse was true at the third location. Blanchability of the extra large grade was significantly higher than the medium grade peanuts at all locations. These results suggest that blanchability may be improved through genotypic selection and sizing of the peanut kernels.

INTRODUCTION

A large percentage of the Virginia type peanut (Arachis hypogaea L.) crop is used by manufacturers for salting (1). Peanuts which blanch readily without splitting are essential to these processors. All factors affecting blanchability are not known, however, maturity and shrivels are known to affect the degree of blanch (2). Previous work (3, 4) has shown that genetic makeup and seed size have an effect on blanchability. Environmental conditions at the time of digging and combining in addition to conditions during the artificial drying process appear to influence blanchability.

The objective of this research was to determine the effect of genotype, seed size and digging date on the blanchability of Virginia type peanuts.

METHODS AND MATERIALS

The peanut variety and seven advanced breeding lines of Virginia type peanut genotypes listed in Table 1 were grown in experiments located in Martin County, North Carolina, Sussex County, Virginia and Suffolk, Virginia as part of the Virginia-North Carolina Peanut Variety and Quality Evaluation Program. Peanut genotypes were replicated three times in each of the two digging dates at each location. Standard recommended cultural practices for the production of high quality peanuts were used. After harvesting and drying, the three replicates were combined for shelling by digging dates. During the shelling process the peanuts were sized with samples collected for blanching from the extra large kernels, those that ride a 21/64 x 1" slotted screen, and medium kernels, those that fall through a 21/64 x 1" slotted screen and ride an 18/64 x 1" slotted screen. Each lot by genotype, digging date and grade from each location was divided into two subsamples for blanching evaluations.

Each sample was white-roasted in a forced air oven to reduce the moisture to approximately four percent. After cooling, a 250-g sample was blanched in a rotating cylinder blanc her using an air pressure of 18 psi for 2.5 minutes as described by Wright and Mozingo (5).

After blanching, samples were visually inspected and separated into four categories (whole blanched, not blanched, splits blanched and partially blanched) and weighed to determine blanching quality. The data are expressed on a percentage basis by weight with blanching loss percentage, hearts and skins, excluded from the results.

RESULTS AND DISCUSSION

Data on the blanchability of the Florigiant variety and the seven peanut breeding lines are given in Table 2. Peanuts with good blanching quality are indicated by a high percentage of whole kernels blanched and a low percentage of kernels not blanched, kernels split during blanching and kernels partially blanched. At each location. Florigiant, NC 17921, NC 17922, and NC 17976 had the best blanchability, while GK 42-910, NC 17404, and NC 77-7 were intermediate, and NC 17977 had poor blanchability. NC 17977 was significantly higher for percentages not blanched and partially blanched than all other lines, thereby, indicating poor blancha-

bility. The lines GK 42-910 and NC 17404 had the highest percentages of kernels split during blanching at each location.

The pedigrees of these lines (Table 1) indicate that when Florigiant was used as the female parent, the blanchability is good, except for NC 77-7. This line has NC 5 as the male parent and previous results (3) have shown that NC 5 does not blanch well.

Results of blanching by grades are presented in Table 3. The extra large grade from each location was higher in percentage of whole blanched and lower in percentage not blanched than the medium grade. This indicates much better blanchability for the extra large grade. Percentage of splits blanched was significantly higher for the mediums than for the extra large at the Martin County, North Carolina location; however, no significant differences was recorded for the Sussex County or Suffolk, Virginia locations. A significantly higher percentage of kernels partially blanched was recorded for the extra large grade at Martin County, North Carolina and Sussex County, Virginia. No significant difference was found at the Suffolk, Virginia location.

The data in Table 4 show variable results among locations for the early and late diggings. At the Martin County, North Carolina location there was no statistically significant difference between the percentage of whole blanched and partially blanched kernels from the early and late diggings, indicating equivalent blanchability. However, these differences were significant at the Sussex County, Virginia and Suffolk, Virginia locations. Better blanchability was obtained in Sussex County from the early digging while the late digging was better at the Suffolk location. Variable environmental conditions from digging to combining and during drying may have had an influence on blanchability, especially since a difference has already been shown at each location for variety or breeding line and grades.

CONCLUSIONS

Peanut breeders may be able to select for improved blanchability in their breeding programs by selection of parental lines and segregating progeny with good blanching qualities. Grade size affects blanchability with extra large kernels having higher blanchability than the medium sized

kernels. Digging date varied in its response to blanchability among locations. Environmental factors at each location during field and artificial drying and curing probably contribute to this interaction.

ACKNOWLEDGEMENTS

Appreciation is expressed to Dr. J. L. Steele, USDA-SEA, AR, Suffolk, Virginia and to R. D. Ashburn, Sylvia K. Porter and Nelsie B. Councill, of the Tidewater Research and Continuing Education Center technical staff for their assistance in conducting this experiment.

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Table 1. Virginia type peanut genotypes and their pedigrees.

Genotype	Pedigree
Florigiant	(Jenkins Jumbo X F 230) X F 334
NC 17921	Florigiant X Florunner
NC 17922	Florigiant X Valencia
GK 42-910	(F 427 X F 416-2) X Florigiant
NC 17976	Florigiant X Spanhoma
NC 17404	NC 2 X Florigiant
NC 17977	NC 343 X Florigiant
NC 77-7	Florigiant X NC 5

Table 2. Blanchability of Virginia type peanut genotypes. Average of two diggings and two grades.

Genotype	% Whole Blanched	% Not Blanched	% Splits Blanched	% Partially Blanched
		Martin County, North Carolina		
Florigiant	68.4 a	18.1 c	9.8 b	2.0 c
NC 17921	68.9 a	17.7 c	8.6 bc	3.1 c
NC 17922	68.2 a	17.6 c	9.6 b	2.7 c
GK 42-910	66.4 a	16.2 c	13.8 a	1.8 c
NC 17976	70.1 a	17.8 c	7.6 bc	2.5 c
NC 17404	61.4 b	18.0 c	15.5 a	3.1 c
NC 17977	27.1 c	47.9 a	5.6 c	17.7 a
NC 77-7	58.3 b	25.4 b	7.5 bc	6.8 b
		Sussex County, Virginia		
Florigiant	50.7 b	37.9 bc	7.8 b	2.1 b
NC 17921	57.8 a	29.5 d	8.3 b	2.4 b
NC 17922	50.6 b	38.3 bc	7.2 b	2.3 b
GK 42-910	49.4 b	36.0 bc	11.6 a	1.6 b
NC 17976	56.4 a	33.5 cd	6.8 b	1.8 b
NC 17404	47.8 b	38.8 bc	9.2 ab	2.7 b
NC 17977	21.8 c	61.6 a	3.3 c	11.8 a
NC 77-7	47.2 b	41.7 b	7.1 b	2.6 b
		Suffolk, Virginia		
Florigiant	69.6 a	18.6 bcd	7.4 cd	2.4 c
NC 17921	69.1 a	16.6 cd	8.1 bcd	3.9 c
NC 17922	71.8 a	15.4 d	8.8 bc	2.1 c
GK 42-910	56.4 c	22.7 b	15.7 a	3.4 c
NC 17976	72.4 a	16.0 d	6.1 d	3.3 c
NC 17404	62.4 b	21.8 bc	9.9 b	3.9 c
NC 17977	30.8 d	44.2 a	3.7 e	19.9 a
NC 77-7	57.8 bc	23.3 b	8.5 bc	8.2 b

Table 3. Blanchability of extra large and medium grade Virginia type peanuts. Average of eight genotypes and two digging dates.

Grade	% Whole Blanched	% Not Blanched	% Splits Blanched	% Partially Blanched
		Martin County, North Carolina		
ELK	66.0 a	17.7 b	8.9 b	5.5 a
Medium	56.2 b	26.9 a	10.6 a	4.4 b
		Sussex County, Virginia		
ELK	52.4 a	33.9 b	7.9 a	4.1 a
Medium	42.0 b	45.4 a	7.5 a	2.7 b
		Suffolk, Virginia		
ELK	68.4 a	15.9 b	8.5 a	5.2 a
Medium	54.1 b	28.7 a	8.5 a	6.6 a

Table 4. Blanchability of Virginia type peanuts from early and late diggings. Average of eight genotypes and two grades.

Digging	% Whole Blanched	% Not Blanched	% Splits Blanched	% Partially Blanched
		Martin County, North Carolina		
Early	60.6 a	24.8 a	8.0 b	4.9 a
Late	61.7 a	19.9 b	11.5 a	5.0 a
		Sussex County, Virginia		
Early	57.4 a	25.8 b	11.0 a	4.0 a
Late	38.0 b	53.6 a	4.4 b	2.8 b
		Suffolk, Virginia		
Early	58.9 b	24.6 a	8.3 a	6.4 a
Late	63.7 a	20.0 b	8.7 a	5.4 a

Volatile Components of Roasted Peanuts: Varietal Comparisons of the Basic Fraction.[1]
G. R. Waller,[2] A. Khettry,[2,4] and C. T.Young.[3,5] Oklahoma State University,[2] Stillwater, OK, and Georgia Agricultural Experiment Station,[3] Experiment, GA.

ABSTRACT

Information on the quantitative analysis of volatile compounds of roasted peanuts remains limited. In most foods, differences in flavor quality exist among plant varieties within a species. This abstract reports a comparison of the basic aroma constituents and sensory evaluation of eight varieties of roasted Spanish, Virginia, Valencia, and Runner type peanuts. The compound identities were confirmed by comparison of their mass spectral and gas chromatographic retention data with those of authentic samples. As usual, pyrazines dominate the basic fraction, with Valencia and NC-2 showing the widest deviations from the Argentine variety, which was used as a standard. Relative amounts of pyrazines are expressed as percentages of the sum of 2,5-(I) and 2,6-dimethylpyrazine (II) (100%) which elute together on the Carbowax 20 M GLC column. I and II are readily formed by heating mixtures of sugars and amino acids and they have a flavor note described as "nutty." They are found at a concentration of 1.1 mg/kg of roasted peanuts in Argentine and Starr varieties. A new compound in the basic fraction of each variety has an apparent molecular weight of 120 and a retention time of 7.1 relative to I and II. It was not formed when the roast was conducted under nitrogen, indicating that it probably requires atmospheric O_2 to be formed. Argentine, Starr and Valencia formed about 2-5 times as much of the new compound as Tifspan, Early Runner, NC-2, NC-5 and Florunner. Over-roasted peanuts contain more pyrazines and the under-roasted less than the standard roast, and only traces of the new compound were found in either type of abnormal roast. These same peanuts were subjected to sensory evaluation.

INTRODUCTION

Information on the quantitative analysis of volatile compounds of roasted peanuts remains limited. Shu and Waller (1971) provided some quantitative data on parts of the basic fraction from several varieties of Spanish peanuts. Walradt et al. (1971) reported 187 compounds in the volatiles (basic, acidic, neutral) of roasted peanuts, of which 142 were recognized for the first time. Johnson et al. (1971a, 1971b) described results of analysis of the basic (25 compounds) and neutral fractions (25 compounds) from Spanish peanuts using a capillary gas chromatograph/high resolution mass spectrometry/data system. This paper reports a comparison of the basic aroma constituents and sensory evaluation of eight varieties of roasted Spanish, Virginia Valencia, and Runner type peanuts. All quantitative results are averages from at least two separate experiments.

MATERIALS AND METHODS

Apparatus

The vacuum degassing system described by Shu and Waller (1971) was used with the following slight modifications: (a) receiver flask 15 had its 24/40 ground-glass joint changed to a ball-and-socket joint with Viton O-ring, (b) reservoir 1 had its ordinary greased stopcock changed to a Teflon screw-type vacuum stopcock so that contact of peanut oil with stopcock grease would be eliminated, (c) receiver flask 13 had its 24/40 joint changed to a ball-and-socket Viton O-ring joint and (d) stopcocks 5 and 12 were eliminated.

Peanut samples

Raw shelled peanuts were used. Argentine and Starr varieties were purchased from Gold Kist, Anadarko, Oklahoma in 1971, and represented the best quality seedstock peanuts available. Early Runner and Florunner were purchased from Gold Kist

[1]Journal Article No. J-3668 of the Agricultural Experiment Station, Oklahoma State University, Stillwater, OK. This research was supported in part by grants from Best Foods Division of Corn Products International and from the National Science Foundation, Research Grant No. GB 20,296. Present address: [4]Universal Fragrances, 124 Case Drive, South Plainfield, NJ 07080; [5]Department of Food Science, N. C. State University, Raleigh, NC 27650.

in Georgia. Tifspan was obtained from Dr. Hammons. Valencia peanuts were a gift from the Southwest Peanut Growers Association of Gorman, Texas. NC-2 and NC-5 were gifts from the North Carolina Agricultural Experiment Station.

Procedure

All peanuts were stored at -4°C until roasted. Otherwise the procedures followed were identical to those published by Shu and Waller (1971) except that (a) oil was always pressed from warm peanuts and 100 ml was taken for flavor analysis, (b) usually the basic fraction was concentrated to 2.5-10 µl, and (c) redistilled Freon-13 was used as extracting solvent rather than methylene chloride.

The GLC analytical column used was 30 ft. x 1/8 inch and was packed with 5% (w/w) Carbowax 20 M on Gas Chrom Q (Auda et al., 1967; Johnson et al., 1971a and b; Shu and Waller, 1971). The conditions used were as follows: injection port temperature 180°C; detector temperature 200°C; helium flow rate 13 ml/min; column temperature isothermal for 5 min at 70°C and then temperature programmed at 10°C/min to 170°C.

Combination gas chromatography-mass spectrometric analysis (Waller, 1967) was performed.

RESULTS AND DISCUSSION

In most foods differences in flavor quality exist among plant varieties within a species. Roasted Spanish peanuts are popular because of their excellent flavor, while Florunner has been the most popular peanut because of its high yield and good flavor. One of the reasons for variation in flavor quality may be variation among flavor precursors in raw peanut that would affect the final volatile fraction of the roasted nuts. A logical method to test this hypothesis is to: (1) separate the flavor components into basic, neutral and acidic fractions; this is a report on the basic fraction; (2) quantitatively analyze these fractions; (3) correlate the pyrazine components of the basic flavor fraction with free amino acids and free sugars in the raw peanuts (Oupadissakoon et al., (1979)), and so on.

Peanut flavor as affected by variety

The results of typical gas-liquid chromatographic (GLC) analyses of the basic fractions are shown in Figures 1 (Argentine variety) and 2 (Florunner variety). By prolonging the GLC analysis, approximately 56 compounds were shown present in the Argentine sample and 58 in the Florunner. A new compound (GLC Peak No. 56) in the basic fraction was produced in each of the eight varieties tested; it had an apparent molecular weight of 120 and a retention time of 7.5 ± 0.3 relative to 2,5-(I) and 2,6-dimethylpyrazine (II). This compound was not formed when the roast was conducted under nitrogen, indicating that its formation probably requires atmospheric oxygen.

The first 19 chromatographic peaks (those used by Shu and Waller) are shown in Table 1. The compound identities were confirmed by comparison of their mass spectral and gas chromatographic retention data with those of authentic samples. As usual, pyrazines dominate the basic fractions, with Valencia and NC-2 showing the widest deviations from the Argentine variety, which was used as a standard. Relative amounts of pyrazines are expressed in Table 1 and 2 as percentages of the sum of I and II (100%), which elute together on the Carbowax 20 M GLC column. I and II are readily formed by heating mixtures of sugars and amino acids and they have a flavor note described as "nutty" (Koehler et al., 1971). They are found at a concentration of 1.1 mg/kg of roasted peanuts in Argentine and Starr varieties. Argentine showing 30-40% as much GLC Peak No. 56 as for I and II), Starr and Valencia formed about 2-5 times as much of the new compound as Tifspan, Early Runner, NC-2, NC-5 and Florunner.

Effect on under-roasting and over-roasting on profile of the basic volatile aroma

The values for this set of experiments are shown in Table 2. In the absence of any kinetic data on the rate of formation of various pyrazines with respect to time one can only speculate that: (a) Over-roasted peanuts contain more pyrazines, and under-roasted less, than the standard roast and only traces of the new com-

pound were found in either type of abnormal roast, and (b) pyrazines of MW 120 and 134 are formed early during roasting while higher-molecular-weight ones form more slowly and do not reach maximum concentration until the normal or over-roasted nut is produced.

Sensory evaluation

These same peanuts were subjected to sensory evaluation at the Georgia Agricultural Experiment Station (Tables 3, 4, 5). They were blanched, oil roasted, salted, and rated by 12 "consumer" taste panelists (CTP) using the hedonic scale of 1-9 (Table 4) and by 7 "expert" taste panelists (ETP) using the CLER score procedure (Table 5). Since top-quality peanuts from each variety were used, it is not surprising that most of the taste panel factors measured were not significant. Probably the most important difference observed was that the Valencia peanuts were rated lower in flavor by the ETP but higher by the CTP, perhaps because they were more difficult to roast properly. Greater immaturity (NC-2 and NC-5) of the Virginia type apparently did not adversely affect the taste panel scores.

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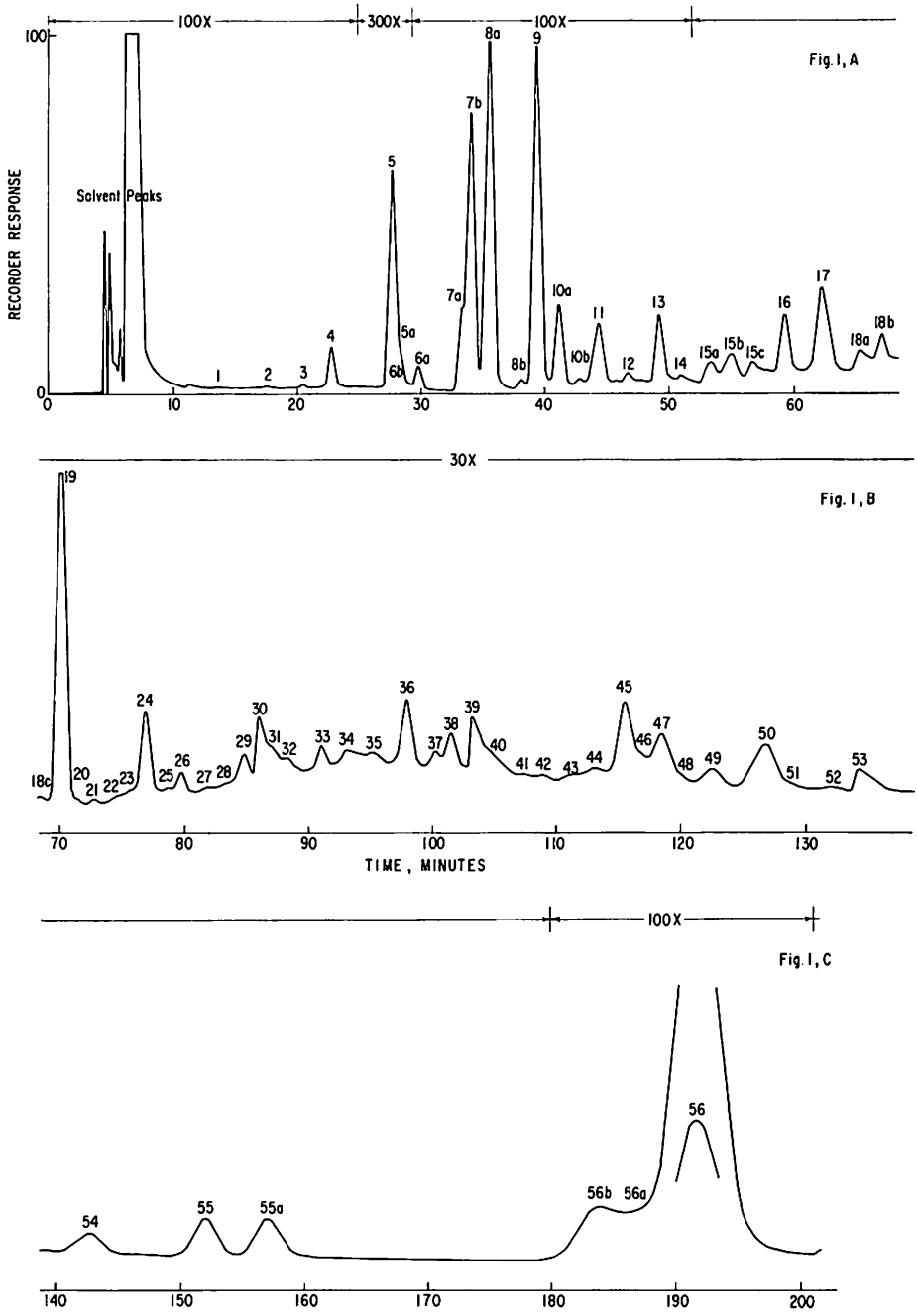

Figure 1. Typical gas chromatogram of the basic fraction of Spanish (Argentine) roasted peanut volatiles. 1-µl (equivalent to 10 ml of peanut oil) injection of the concentrated basic fraction on a 30 ft x 1/8 in, Carbowax 20M, 100-120 mesh on base washed Gas Chromo Sorb at the following conditions: run isothermally for 5 min. at 70°C, then temperature programmed linearly from 70° to 160°C at 10°/min, helium flow 13 ml/min, hydrogen flow 12 ml/min, air flow 40 ml/min, injection temp. 180° and hydrogen flame detector at 200°C. Compound numbers from 1-19 correspond to Table 1; other numbers represent new compounds present in the basic fraction.

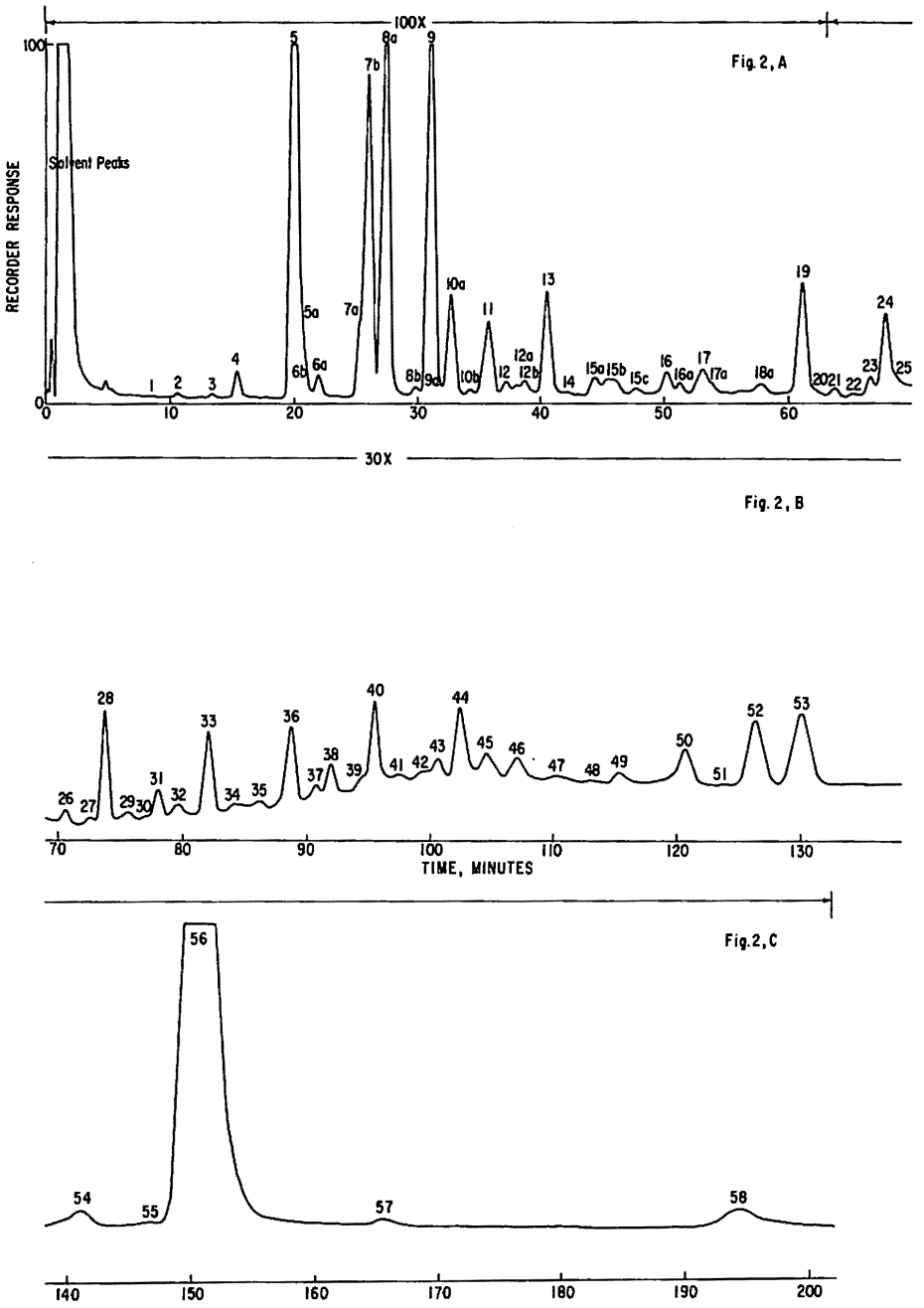

Figure 2. Typical gas chromatogram of the basic fraction of Runner (Florunner) roasted peanut volatiles. 1-µl (equivalent to 20 ml of peanut oil) injection of the concentrated basic fraction. Conditions the same as for Figure 1 except that temperature program was started immediately following injection.

TABLE 1. RELATIVE CONCENTRATION OF BASIC FRACTION OF SEVERAL VARIETIES OF SPANISH, RUNNER AND VIRGINIA TYPE PEANUTS

Spanish Varieties			Valencia	COMPOUND	Peak No.	Relative Retention Time	Runner Varieties		Virginia Varieties	
Tifspan	Argentine	Starr					Early Runner	Florunner	NC–2	NC–5
					1					
Tr	Tr	Tr	Tr	Pyridine	2		Tr	Tr	Tr	Tr
Tr	Tr	Tr	Tr	Pyrazine	3		Tr	Tr	Tr	Tr
3.8	5.0	6.9	7.4	2-Methylpyrazine	4		8.2	7.2	4.4	3.9
100.0	100.0	100.0	100.0	2,5-Dimethylpyrazine and/or 2, 6-Dimethylpyrazine	5	1.00	100.00	100.00	100.00	100.00
8.6	11.9	15.5	22.2	2-Ethylpyrazine	6[a]	1.02	15.20	11.1	9.90	11.3
4.2	3.8	4.5	5.0	2, 3-Dimethylpyrazine	6[b]	1.08	4.7	4.3	6.80	3.3
11.7	13.7	9.9	21.9	2-Ethyl-6-methylpyrazine	7[a]	1.21	12.3	10.6	20.5	14.3
50.0	48.8	46.30	80.9	2-Ethyl-5-methylpyrazine	7[b]	1.23	45.6	48.8	66.2	59.7
67.7	59.1	47.0	78.2	2-Ethyl-3-methylpyrazine and/or Trimethylpyrazine	8[a]	1.28	54.4	65.4	82.5	67.9
1.5	1.1	0.8	2.6	M.W. 136	8[b]	1.38	1.1	2.3	2.5	1.6
56.7	57.3	39.6	100.4	2,5-Dimethyl-3-ethylpyrazine	9	1.42	47.1	60.1	100.7	75.8
18.4	16.8	13.8	33.5	2, 3-Dimethyl-5-ethylpyrazine and/or 2, 6-Dimethyl-5-ethylpyrazine	10[a]	1.49	13.0	16.0	25.7	25.3
0.6	1.1	0.4	1.6	Tetramethyl pyrazine	10[b]	1.55	0.6	1.4	0.9	0.4
15.2	13.7	11.4	32.2	2, 6-Diethyl-3-methylpyrazine and/or 2, 3-Diethyl-3-methylpyrazine	11	1.61 1.66	10.0	14.4	28.8	24.7
—	1.8	1.0	3.6	2-Ethyl-2, 5, 6-trimethylpyrazine	12	1.69	0.8			
18.9	10.1	11.0	26.2	$C_8H_{10}N_2$, M.W. = 134	13	1.78	9.7	14.8	18.0	15.2
—	—	0.4	—	M.W. 150	14	1.85	—	—	—	—
—	—	1.5	—	M.W. 134	15a	1.93	—	—	—	—
—	—	1.7	—		15b	2.00	—	—	—	—
—	—	0.8	—		15c	2.06	—	—	—	—
5.7	4.4	3.3	13.8	Methyl-2, 3-cyclopentanopyrazine	16	2.15	4.0	5.0	6.6	8.7
17.4	10.6	8.2	22.6	2-Isopropenylpyrazine	17	2.26	4.6	12.2	17.0	19.0
—	—	0.6	—	M.W. 148	18a	2.37	—	—	—	—
—	—	0.8	—		18b	2.43	—	—	—	—
—	—	0.9	—		18c	2.49	—	—	—	—
34.2	34.4	13.3	58.4	Methylisopropenylpyrazine	19	2.55	16.0	26.2	31.8	27.6

TABLE 2. RELATIVE CONCENTRATION OF THE PROMINENT DIFFERENCES IN THE BASIC FRACTION FROM STARR VARIETY OF SPANISH PEANUTS

COMPOUND	Peak No.	Normal Roast	Under-Roast	Over-Roast
2-Methyl Pyrazine	4	6.9	3.9	10.7
2, 5-and 2, 6-Dimethyl pyrazine	5	100.0	100.0	100.0
2-Ethylpyrazine	6a	15.5	11.4	16.0
2, 3-Dimethylpyrazine	6b	4.5	–	5.0
2-Ethyl-6-methylpyrazine	7a	9.9	4.2	30.8
2-Ethyl-5-methylpyrazine	7b	46.3	47.0	52.6
2-Ethyl-3 methylpyrazine and/or Trimethylpyrazine	8a	47.0	38.0	54.3
M. W. 136	8b	0.8	–	3.0
2, 5-Dimethyl-3-ethylpyrazine	9	39.6	28.8	47.8
2, 3-Dimethyl-5-ethylpyrazine and/ or 2, 6-Dimethyl-5-ethylpyrazine	10a	13.8	12.2	16.0
Tetramethyl pyrazine	10b	0.4	–	1.0
2, 6-Dimethyl-3-methylpyrazine and/or 2, 3-Diethyl-3-methylpyrazine	11	11.4	10.4	16.7
M. W. 134, $C_8H_{10}N_2$	13	11.0	13.3	5.6
Methyl-2, 3-cyclopentanopyrazine	16	3.3	6.7	6.0
2-Isopropenylpyrazine	17	8.2	24.0	7.3
Methylisopropenylpyrazine	19	13.3	31.9	19.1
PYRAZINE DISTRIBUTION		NORMAL	LESS	MORE

Normal peanuts were roasted for 24 minutes.
Under-roasted peanuts were roasted for 18 minutes.
Over-roasted peanuts were roasted for 30 minutes.

TABLE 3. MATURITY, PROTEIN AND OIL CONTENTS OF THE SPANISH, RUNNER AND VIRGINIA TYPE PEANUTS

Variety	Arginine Maturity Index (AMI)	Protein %	Fat %
Florunner	19	25.2	47.4
Valencia	30	27.5	46.8
Tifspan	20	28.2	48.4
Early Runner	27	26.6	45.9
Starr	27	28.4	46.8
Argentine	23	25.4	46.8
NC 2	49	26.7	48.7
NC 5	55	25.4	48.3
Average	31	26.7	47.4

TABLE 4. ORGANOLEPTIC RESULTS FROM SPANISH, RUNNER AND VIRGINIA TYPE PEANUTS

Results from 12 "Consumer" Panelists

Variety	Appearance	Color	Aroma	Texture	Flavor	Total
		*		*		
Florunner	5.3[ab]	5.7	6.0[ab]	6.7	5.7[ab]	29.3[a]
Valencia	4.3[b]	4.0	6.0[ab]	5.4	4.0[c]	23.7[b]
Tifspan	5.8[a]	6.0	6.5[a]	7.2	5.8[a]	31.3[a]
Early Runner	6.3[a]	6.2	6.8[a]	6.7	6.2[a]	32.2[a]
Starr	5.3[ab]	5.3	6.7[a]	6.0	5.0[abc]	28.3[a]
Argentine	5.8[a]	5.3	5.3[b]	6.0	5.7[ab]	28.2[a]
NC 2	6.5[a]	6.1	6.3[a]	7.0	6.2[a]	32.1[a]
NC 5	6.0[a]	5.7	6.7[a]	6.2	4.2[bc]	28.7[a]
Average	5.7	5.5	6.3	6.4	5.3	29.2

* No significant differences between varieties on starred items.

Any two values in same column not marked with the same letters are significantly different.

TABLE 5. ORGANOLEPTIC RESULTS FROM SPANISH, RUNNER AND VIRGINIA TYPE PEANUTS

Results of 7 "Expert" panelists using CLER Score method

	FLAVOR					ROAST				
	Bad off	Low off	Low Peanut	Good Peanut	CLER SCORE	Excellent	Good	Under	Over	Roast Score
	*	*	*	*	*	*	*	*		
Florunner	1.86	6.14	8.57	3.43	49.0	3.14	13.29	1.29	2.29[bcd]	2.14[bc]
Valencia	3.29	8.14	7.00	1.57	37.0	2.00	7.43	0.00	10.57[a]	2.96[a]
Tifspan	0.86	3.86	12.86	2.43	54.6	4.29	11.71	2.43	1.57[d]	2.06[c]
Early Runner	1.86	4.71	11.00	2.43	49.9	4.29	12.57	1.29	2.29[bcd]	2.12[bc]
Starr	1.14	4.57	9.00	5.14	57.3	3.86	13.29	1.00	1.86[cd]	2.04[c]
Argentine	0.57	6.00	9.86	3.71	54.1	4.43	9.86	0.14	5.57[b]	2.34[bc]
NC 2	0.43	6.00	11.14	2.43	51.6	2.57	10.00	2.00	5.43[bc]	2.51[b]
NC 5	1.00	7.29	9.57	2.14	46.7	3.86	10.43	1.14	4.57[bcd]	2.32[bc]
Average	1.37	5.84	9.87	2.91	50.0	3.55	11.07	1.16	4.27	2.31

* No significant differences between varieties on starred items.

Any two values in same column not marked with the same letters are significantly different.

Amino Acid Composition of Peanut (Arachis hypogaea L.) Samples from the 1973 and 1974 Uniform Peanut Performance Tests. Clyde T. Young, Department of Food Science, P. O. Box 5992, North Carolina State University, Raleigh, N. C. 27650.

ABSTRACT

Peanut samples from the Uniform Peanut Performance Tests (UPPT) were grown by breeders in the three major U. S. growing areas. Samples from 11 locations, representing up to 31 entries, were received, shelled, and graded. The total edible kernels were ground to pass thru an 8-mesh screen, and were frozen until analyzed. Each sample (100 mg) was hydrolyzed and analyzed for total amino acid content. Results are expressed as g amino acid/100 g of peanuts (for the nutritionist) and as % of total which is g amino acid/100 g of amino acids (for the peanut breeder). Statistical analysis of the data showed significant year, location, and variety effects. Significant variety-environmental interactions were found. A summary of the average quantities of each amino acid (g/100 g of peanuts, % of total) for all samples analyzed are as follows: ASP (3.51, 11.87); THR (0.74, 2.51); SER (1.41, 4.79); GLU (6.47, 21.92); PRO (1.25, 4.22); GLY (1.72, 5.83); ALA (1.13, 3.84); CYS (0.22, 0.73); VAL (1.22, 4.12); MET (0.25, 0.84); ILE (1.03, 3.50); LEU (1.97, 6.67); TYR (1.33, 4.51); PHE (1.49, 5.05); HIS (0.81, 2.76); LYS (1.00, 3.42); NH_4 (0.51, 1.72); ARG (3.45, 11.69); and SUM (29.53 g of amino acids/100 g of peanuts).

INTRODUCTION

Peanut breeders in the three major U. S. growing areas (Virginia-North Carolina, Georgia-Florida-Alabama which is referred to as the Southeast area, and Texas-Oklahoma which is referred to as the Southwest area) evaluate potential new varieties through the Uniform Peanut Performance Tests. Reports on yield and shelling grade performance are published (Hammons and Tai, 1976a, 1976b), but previously no comprehensive chemical compositional studies have been made on these peanuts.

This study was undertaken to quantitate the influence of variety and test-environment upon amino acid composition of the UPPT peanut varieties and experimental lines grown in 1973 and 1974.

MATERIALS AND METHODS

Peanut samples (2 replications) were obtained soon after harvest and stored at -18 C prior to sample preparation and analysis. Total edible kernels (25 g) were ground in a Wiley laboratory mill (8 mesh screen) and 100 mg was hydrolyzed (Young, 1978) and analyzed on a Durrum D-500 amino acid analyzer for total amino acid content: aspartic acid (ASP); threonine (THR); serine (SER); glutamic acid (GLU); proline (PRO); glycine (GLY); alanine (ALA); cystine (CYS); valine (VAL); methionine (MET); isoleucine (ILE); leucine (LEU); tyrosine (TYR); phenylalanine (PHE); histidine (HIS); lysine (LYS); ammonia (NH_4) and arginine (ARG). The appropriate statistical treatment, either an analysis of variance (AOV) or general linear model (GLM) was used to evaluate the data. The statistical data will be published in an Experiment Station bulletin.

RESULTS AND DISCUSSION

The variety (V) and location (L) codes are shown in Table 1 and these codes are the same as those used by Hammons and Tai (1976a, 1976b).

Some disagreement exists concerning how best to express amino acid compositional data (Heinis et al, 1975). We have elected to present the data in two forms. Since most peanuts in the U. S. are consumed or processed as a full fat product and also the data in the FAO (1970, 1973) and USDA (1968, 1976, 1977, 1978) handbooks report amino acid content as g/100 g of edible portion of the food, the data in Table 2 shows the amino acid content as grams amino acid/100 grams of peanuts. Those interested in nutritional labeling (processors, and nutritionists) can use data in this form without doing additional calculations as often are required for data expressed as a value for peanut meal. At the end of Table 2 are

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Table 1. Variety and location codes for the 1973 and 1974 UPPT peanut samples.

Variety or Experimental Line						Locations	
1	Argentine	12	Georgia 123	22	VA 72R	11	Suffolk, VA
2	Comet	13	GK 19	23	UF 439-16-6	21	Lewiston, NC
3	Spancross	14	TP 1025	24	UF 70115	31	Tifton, GA
4	Spanhoma	15	GK 53	25	Florunner	41	Headland, AL
5	Starr	16	AU-1	26	UF 714021	51	Gainesville, FL
6	Tifspan	17	Shulamith	27	UF 73307	52	Marianna, FL
7	TP 716-2-1	18	VA 70 Comp.	28	NC 17163	61	College Station,TX
8	TP 931	19	AU-2	29	NC 17167	63	Pearsall, TX
9	Goldin I	20	Florigiant	30	GK 3	71	Perkins, OK
10	AU-3	21	NC-FLA 14	31	GA 194R	72	Ft. Cobb, OK
11	Georgia 116						

listed the grand mean for both years combined along with the minimum, maximum, and coefficient of variation (C.V.) values for each amino acid. The average content values are similar to those reported by Heinis et al. (1975) and Heinis (1978). The C.V. values (when calculated using the mean value for 2 replications) are about one-half of those reported by Heinis et al. (1975) who had analyzed much more diverse materials in their study. All of the amino acids were added giving a trait designated as SUM. This total weight of hydrolyzed amino acids is approximately 15% greater than that of the protein from which they are derived because of the addition of a molecule of water for each peptide bond hydrolyzed. Thus, if one multiplies this SUM by 0.85, he will obtain a very good estimate of the protein content of the peanut sample.

Since protein content and the resulting amino acid content when expressed as g/100 g of peanuts is effected by so many factors such as variety, maturity, seed size, and environment, the peanut breeder can better use the data expressed as % of total (grams amino acid/100 grams of amino acids) to minimize these influences. These data are shown in Table 3. The grand mean for % of total for both years along with the minimum, maximum, and C.V. values for each amino acid is shown at the end of Table 3. Expression of the amino acid data as % of total reduces the variation considerably compared to data expressed as g/100 g of peanuts as noted by the lower C.V.'s in Table 3. When these summary values are compared to the FAO (1973) recommended provisional pattern, the amino acids methionine, threonine, and lysine are quite limiting in all varieties. Valine is also slightly limiting in all samples. Isoleucine is slightly limiting in most samples. This agrees with a previous report (Young et al., 1973). Tyrptophan, another essential amino acid, was not analyzed in this study. This narrow range of variability among these peanut lines that are current and future commercial varieties indicates that breeders select lines that may be similar in genetic condition and subject to genetic vulnerability as previously reported (Hammons, 1976).

Due to the varying number of entries each year at the same or different locations, a GLM procedure was used to obtain a statistical evaluation of the data. A significant location, variety, and location x variety interaction effect was obtained for almost every amino acid. The mean and C.V. for each amino acid for each year was examined. An AOV was done for each amino acid on each location for each year. A study of the rank (Waller-Duncan test) of each variety within each location for each amino acid was made. To examine year effect and year interactions, it was necessary to select a combination of location and varieties. Three possible analyses of variance were made and the summary indicates that year effects and year interactions were significant for most amino acids. Space will not permit the publication of these data, but they will be presented in a bulletin. Additionally, the cooperators may be able to include some of these data in their publications as it relates to their research with these varieties and experimental lines.

REFERENCES

1. FAO. 1970. "Amino-acid Content of Foods and Biological Data on Proteins." Report Series No. 24.

TABLE 2. 1973-74 UPT - GRAMS AMINO ACID/100 GRAMS OF PEANUTS - MEAN OF TWO REPS

YR	L	V	ASP	THR	SER	GLU	PRO	GLY	ALA	CYS	VAL	MET	ILE	LEU	TYR	PHE	HIS	LYS	NH4	ARG	SUM
73	11	1	3.45	0.73	1.38	6.34	1.19	1.61	1.12	0.22	1.22	0.21	0.97	1.92	1.39	1.59	0.85	0.99	0.41	3.37	28.97
73	11	2	3.27	0.70	1.32	6.07	1.14	1.57	1.06	0.19	1.17	0.20	0.94	1.82	1.30	1.52	0.82	0.94	0.40	3.17	27.59
73	11	3	3.39	0.72	1.38	6.24	1.20	1.64	1.08	0.21	1.21	0.18	0.96	1.88	1.36	1.56	0.86	1.00	0.49	3.34	28.73
73	11	4	3.59	0.75	1.44	6.64	1.26	1.67	1.16	0.23	1.27	0.23	1.01	1.99	1.40	1.65	0.88	1.03	0.53	3.46	30.20
73	11	5	3.57	0.75	1.43	6.57	1.25	1.64	1.16	0.23	1.26	0.19	1.01	2.02	1.44	1.64	0.88	1.02	0.50	3.50	30.06
73	11	6	3.33	0.72	1.36	6.12	1.17	1.59	1.08	0.21	1.20	0.22	0.95	1.84	1.29	1.55	0.85	0.99	0.47	3.24	28.17
73	11	7	3.59	0.75	1.43	6.62	1.26	1.67	1.15	0.19	1.28	0.20	1.01	1.99	1.43	1.67	0.88	1.02	0.54	3.46	30.17
73	11	8	3.56	0.74	1.41	6.58	1.25	1.63	1.13	0.24	1.27	0.23	1.00	1.95	1.37	1.62	0.87	1.02	0.52	3.50	29.90
73	11	9	3.12	0.69	1.26	5.76	1.08	1.50	1.03	0.17	1.14	0.21	0.90	1.77	1.20	1.40	0.79	0.92	0.42	2.91	26.29
73	11	10	3.25	0.69	1.30	5.98	1.14	1.49	1.06	0.22	1.19	0.22	0.93	1.83	1.27	1.47	0.82	0.96	0.47	3.14	27.44
73	11	16	3.36	0.68	1.35	6.23	1.13	1.78	1.07	0.25	1.08	0.19	0.92	1.91	1.32	1.47	0.84	1.04	0.40	3.37	28.41
73	11	17	3.09	0.67	1.26	5.78	1.05	1.59	1.02	0.19	1.07	0.22	0.90	1.76	1.21	1.29	0.76	0.96	0.43	2.98	26.25
73	11	18	2.97	0.64	1.21	5.54	1.01	1.56	0.97	0.21	1.06	0.21	0.85	1.71	1.13	1.37	0.79	0.92	0.43	2.86	25.45
73	11	19	3.21	0.66	1.29	5.97	1.10	1.73	1.03	0.27	1.06	0.25	0.90	1.83	1.27	1.45	0.81	1.02	0.47	3.25	27.57
73	11	20	3.30	0.67	1.33	6.10	1.12	1.74	1.07	0.26	1.09	0.19	0.92	1.88	1.29	1.45	0.80	1.00	0.50	3.39	28.14
73	11	21	3.56	0.77	1.45	6.50	1.25	1.62	1.18	0.21	1.28	0.22	1.02	2.00	1.40	1.50	0.86	1.01	0.47	3.41	29.72
73	11	22	3.36	0.72	1.34	6.23	1.15	1.60	1.10	0.21	1.14	0.25	0.97	1.90	1.26	1.39	0.79	1.03	0.47	3.36	28.27
73	11	23	3.06	0.67	1.26	5.64	1.06	1.56	1.01	0.21	1.11	0.21	0.87	1.75	1.22	1.38	0.78	0.93	0.48	2.98	26.18
73	11	24	3.20	0.70	1.34	5.93	1.09	1.69	1.05	0.19	1.11	0.22	0.91	1.81	1.25	1.44	0.81	0.97	0.45	3.07	27.25
73	11	25	3.17	0.66	1.29	5.81	1.08	1.75	1.03	0.23	1.02	0.20	0.88	1.82	1.24	1.39	0.78	0.99	0.46	3.07	26.88
73	11	26	3.17	0.71	1.31	5.90	1.11	1.52	1.05	0.22	1.19	0.23	0.92	1.81	1.25	1.40	0.79	0.94	0.46	3.12	27.09
73	31	1	3.29	0.72	1.31	6.19	1.16	1.60	1.07	0.22	1.20	0.34	1.15	1.85	1.23	1.41	0.75	0.90	0.51	3.22	28.10
73	31	2	3.51	0.75	1.38	6.55	1.24	1.68	1.14	0.17	1.27	0.28	1.13	2.05	1.29	1.52	0.79	0.96	0.58	3.55	29.87
73	31	3	3.49	0.73	1.34	6.52	1.23	1.70	1.12	0.21	1.25	0.32	1.16	2.07	1.26	1.51	0.79	0.94	0.48	3.45	29.57
73	31	4	3.51	0.74	1.43	6.57	1.24	1.68	1.12	0.21	1.24	0.30	1.02	1.93	1.30	1.51	0.81	0.95	0.45	3.46	29.47
73	31	5	3.16	0.68	1.23	5.96	1.11	1.53	1.02	0.18	1.15	0.28	0.95	1.80	1.18	1.32	0.70	0.85	0.59	3.13	26.83
73	31	6	3.37	0.72	1.34	6.26	1.21	1.61	1.09	0.20	1.22	0.20	1.02	1.86	1.23	1.42	0.77	0.94	0.45	3.26	28.17
73	31	7	3.39	0.72	1.40	6.36	1.20	1.65	1.09	0.21	1.19	0.34	0.98	1.83	1.31	1.45	0.77	0.91	0.53	3.30	28.63
73	31	8	3.22	0.69	1.30	6.03	1.13	1.59	1.05	0.19	1.17	0.26	1.03	1.87	1.17	1.39	0.73	0.87	0.53	3.20	27.43
73	31	9	3.04	0.66	1.20	5.68	1.08	1.54	1.00	0.13	1.11	0.23	0.92	1.72	1.14	1.26	0.70	0.86	0.50	2.96	25.79
73	31	10	3.14	0.67	1.22	5.89	1.10	1.56	1.01	0.13	1.17	0.28	1.04	1.78	1.11	1.31	0.70	0.85	0.51	3.10	26.63
73	31	16	3.39	0.70	1.39	6.37	1.19	1.76	1.11	0.28	1.09	0.30	0.97	1.89	1.20	1.40	0.77	1.03	0.51	3.56	28.91
73	31	17	3.05	0.69	1.29	5.84	1.08	1.68	1.00	0.22	1.06	0.28	1.06	1.77	1.11	1.31	0.76	0.95	0.49	3.08	26.72
73	31	18	3.26	0.71	1.36	6.20	1.14	1.69	1.06	0.26	1.13	0.24	0.95	1.85	1.22	1.37	0.79	0.94	0.40	3.34	27.91
73	31	19	3.38	0.69	1.39	6.36	1.18	1.83	1.09	0.29	1.08	0.23	0.97	1.92	1.28	1.40	0.76	1.04	0.48	3.51	28.88
73	31	20	3.40	0.69	1.39	6.46	1.18	1.83	1.08	0.29	1.08	0.22	0.97	1.89	1.25	1.40	0.76	1.01	0.39	3.53	28.84
73	31	21	3.60	0.79	1.50	6.82	1.30	1.66	1.15	0.27	1.30	0.41	1.20	2.02	1.39	1.50	0.85	0.98	0.45	3.57	30.77
73	31	22	3.46	0.75	1.42	6.54	1.23	1.76	1.11	0.25	1.19	0.23	1.01	1.93	1.20	1.44	0.82	1.02	0.44	3.51	29.32
73	31	23	3.27	0.70	1.38	6.22	1.14	1.72	1.05	0.27	1.11	0.25	0.96	1.85	1.28	1.34	0.74	0.95	0.38	3.38	28.01
73	31	24	3.12	0.70	1.35	5.90	1.11	1.68	1.02	0.25	1.10	0.22	0.92	1.76	1.13	1.31	0.78	0.92	0.44	3.11	26.81
73	31	25	3.38	0.73	1.41	6.43	1.20	1.73	1.08	0.27	1.19	0.23	0.99	1.90	1.21	1.41	0.76	0.94	0.40	3.41	28.67
73	31	26	3.36	0.76	1.41	6.37	1.20	1.58	1.09	0.26	1.25	0.25	0.99	1.88	1.24	1.42	0.79	0.93	0.45	3.28	28.53
73	31	31	3.75	0.78	1.51	7.07	1.32	1.80	1.21	0.29	1.26	0.22	1.07	2.08	1.39	1.62	0.86	1.05	0.50	3.81	31.59
73	41	1	3.81	0.80	1.56	7.13	1.36	1.78	1.22	0.28	1.31	0.27	1.15	2.15	1.48	1.69	0.87	1.06	0.52	3.76	32.20
73	41	2	3.86	0.80	1.57	7.18	1.37	1.83	1.23	0.24	1.34	0.24	1.11	2.12	1.48	1.70	0.90	1.06	0.47	3.83	32.33
73	41	3	3.69	0.77	1.48	6.84	1.30	1.71	1.19	0.21	1.27	0.27	1.06	2.03	1.39	1.60	0.84	0.99	0.46	3.62	30.73
73	41	4	4.00	0.83	1.61	7.43	1.41	1.81	1.28	0.26	1.38	0.26	1.14	2.19	1.44	1.69	0.91	1.10	0.50	3.94	33.20
73	41	5	3.74	0.78	1.54	6.95	1.35	1.79	1.21	0.25	1.28	0.21	1.08	2.06	1.43	1.58	0.82	1.01	0.46	3.74	31.28

TABLE 2. 1973-74 UPT - GRAMS AMINO ACID/100 GRAMS OF PEANUTS - MEAN OF TWO REPS

YR	L	V	ASP	THR	SER	GLU	PRO	GLY	ALA	CYS	VAL	MET	ILE	LEU	TYR	PHE	HIS	LYS	NH4	ARG	SUM
73	41	6	3.72	0.78	1.49	6.88	1.32	1.69	1.19	0.21	1.29	0.22	1.07	2.05	1.39	1.60	0.85	1.03	0.45	3.67	30.89
73	41	7	3.90	0.81	1.56	7.23	1.37	1.79	1.25	0.22	1.34	0.24	1.13	2.15	1.43	1.69	0.90	1.05	0.46	3.84	32.56
73	41	8	3.88	0.80	1.54	7.21	1.37	1.78	1.23	0.23	1.34	0.27	1.21	2.20	1.50	1.68	0.88	1.01	0.47	3.85	32.44
73	41	9	3.69	0.80	1.57	6.86	1.28	1.80	1.20	0.25	1.30	0.26	1.06	2.05	1.35	1.58	0.91	1.02	0.45	3.67	31.10
73	41	10	3.81	0.80	1.52	7.12	1.33	1.71	1.22	0.24	1.33	0.27	1.12	2.12	1.34	1.62	0.88	1.03	0.44	3.72	31.64
73	41	16	3.79	0.76	1.54	7.07	1.35	1.96	1.21	0.30	1.19	0.22	1.08	2.09	1.36	1.58	0.81	1.09	0.46	3.89	31.77
73	41	17	3.64	0.78	1.49	6.53	1.30	1.85	1.17	0.29	1.22	0.31	1.05	1.97	1.36	1.53	0.86	1.06	0.41	3.70	30.80
73	41	18	3.59	0.77	1.46	6.71	1.28	1.78	1.17	0.25	1.22	0.24	1.05	1.99	1.29	1.54	0.83	1.02	0.46	3.71	30.38
73	41	19	3.78	0.76	1.55	7.09	1.34	2.00	1.19	0.31	1.17	0.36	1.19	2.10	1.40	1.53	0.86	1.17	0.53	3.98	32.32
73	41	20	3.68	0.75	1.47	6.90	1.30	1.38	1.18	0.29	1.17	0.24	1.07	2.04	1.35	1.50	0.78	1.08	0.48	3.86	31.02
73	41	21	3.86	0.82	1.54	7.10	1.39	1.72	1.23	0.28	1.36	0.32	1.29	2.21	1.48	1.59	0.86	1.04	0.44	3.80	32.32
73	41	22	3.55	0.77	1.42	6.64	1.28	1.76	1.15	0.27	1.21	0.29	1.11	2.00	1.31	1.54	0.82	1.04	0.40	3.57	30.14
73	41	23	3.66	0.79	1.50	6.81	1.31	1.81	1.18	0.26	1.26	0.22	1.06	2.03	1.34	1.52	0.83	1.06	0.48	3.66	30.78
73	41	24	3.67	0.77	1.45	6.86	1.30	1.81	1.18	0.26	1.25	0.23	1.06	2.03	1.37	1.59	0.84	1.04	0.43	3.75	30.87
73	41	25	3.83	0.79	1.55	7.06	1.36	1.92	1.23	0.26	1.27	0.25	1.09	2.11	1.44	1.56	0.85	1.09	0.46	3.93	32.03
73	41	26	3.52	0.78	1.44	6.60	1.26	1.60	1.14	0.27	1.28	0.26	1.02	1.96	1.33	1.48	0.82	1.00	0.41	3.57	29.75
73	41	31	3.86	0.81	1.55	7.23	1.37	1.86	1.24	0.28	1.29	0.32	1.23	2.20	1.49	1.64	0.90	1.13	0.54	3.95	32.90
73	51	1	3.35	0.73	1.39	6.18	1.18	1.65	1.13	0.17	1.21	0.24	1.00	1.89	1.24	1.51	0.81	0.95	0.59	3.29	28.53
73	51	2	3.69	0.78	1.50	6.80	1.28	1.72	1.22	0.20	1.29	0.24	1.07	2.05	1.33	1.63	0.89	1.03	0.45	3.59	30.77
73	51	3	3.75	0.79	1.52	6.91	1.35	1.75	1.21	0.19	1.29	0.22	1.06	1.99	1.39	1.56	0.85	1.03	0.47	3.61	30.95
73	51	4	3.66	0.77	1.50	6.71	1.30	1.72	1.22	0.19	1.28	0.27	1.17	2.10	1.40	1.61	0.86	1.01	0.55	3.54	30.88
73	51	5	3.60	0.77	1.47	6.64	1.25	1.71	1.19	0.17	1.28	0.25	1.07	2.03	1.40	1.59	0.86	1.03	0.55	3.53	30.40
73	51	6	3.35	0.72	1.38	6.15	1.19	1.59	1.14	0.20	1.20	0.31	0.98	1.86	1.31	1.46	0.79	0.92	0.51	3.27	28.34
73	51	7	3.86	0.82	1.59	7.22	1.34	1.81	1.24	0.19	1.34	0.25	1.10	2.08	1.45	1.71	0.95	1.10	0.47	3.73	32.24
73	51	8	3.44	0.73	1.41	6.43	1.21	1.67	1.14	0.19	1.23	0.25	1.02	1.90	1.34	1.54	0.85	0.98	0.38	3.39	29.10
73	51	9	3.39	0.75	1.38	6.33	1.19	1.64	1.13	0.24	1.22	0.27	0.97	1.85	1.34	1.44	0.82	0.96	0.57	3.27	28.75
73	51	10	3.30	0.72	1.36	6.13	1.14	1.57	1.10	0.20	1.19	0.28	1.06	1.87	1.27	1.45	0.81	0.94	0.38	3.31	28.10
73	51	16	3.47	0.70	1.41	6.47	1.17	1.49	1.11	0.23	1.10	0.23	0.99	1.91	1.32	1.50	0.82	1.05	0.53	3.62	29.52
73	51	17	3.30	0.71	1.34	6.19	1.16	1.72	1.09	0.20	1.14	0.21	0.94	1.87	1.24	1.41	0.78	0.96	0.52	3.24	28.04
73	51	18	3.65	0.77	1.48	6.87	1.29	1.75	1.20	0.27	1.26	0.30	1.03	2.06	1.38	1.50	0.88	1.01	0.66	3.62	30.93
73	51	19	3.49	0.70	1.41	6.50	1.19	1.92	1.13	0.17	1.11	0.27	1.14	2.02	1.32	1.53	0.79	1.05	0.57	3.37	29.87
73	51	20	3.26	0.67	1.33	6.02	1.15	1.77	1.08	0.19	1.05	0.22	0.93	1.85	1.15	1.35	0.76	0.99	0.61	3.28	27.66
73	51	21	3.64	0.79	1.49	6.74	1.30	1.68	1.18	0.21	1.32	0.22	1.03	2.02	1.37	1.53	0.89	0.97	0.52	3.45	30.40
73	51	22	3.35	0.72	1.34	6.26	1.18	1.69	1.10	0.21	1.15	0.21	0.96	1.89	1.29	1.43	0.62	1.00	0.52	3.31	28.45
73	51	23	3.36	0.71	1.40	6.23	1.21	1.73	1.10	0.19	1.17	0.26	0.98	1.90	1.23	1.38	0.82	1.00	0.60	3.21	28.48
73	51	24	3.27	0.70	1.34	6.11	1.17	1.75	1.09	0.16	1.13	0.21	0.95	1.87	1.26	1.39	0.79	0.97	0.61	3.19	27.97
73	51	25	3.59	0.73	1.45	6.66	1.26	1.94	1.16	0.24	1.14	0.21	1.02	2.04	1.39	1.47	0.80	1.05	0.62	3.60	30.57
73	51	26	3.35	0.75	1.38	6.28	1.20	1.60	1.10	0.19	1.23	0.22	0.96	1.88	1.30	1.42	0.81	0.94	0.58	3.20	28.40
73	51	31	3.63	0.76	1.47	6.80	1.24	1.84	1.18	0.18	1.23	0.24	1.03	2.02	1.40	1.65	0.86	1.05	0.58	3.57	30.73
73	52	1	4.03	0.86	1.66	7.60	1.44	1.89	1.27	0.29	1.38	0.28	1.15	2.19	1.47	1.80	0.90	1.14	0.43	4.03	33.61
73	52	2	3.81	0.81	1.56	7.12	1.37	1.92	1.24	0.23	1.35	0.24	1.11	2.09	1.43	1.67	0.83	1.07	0.57	3.77	32.25
73	52	3	3.80	0.80	1.56	7.12	1.36	1.78	1.20	0.25	1.29	0.32	1.14	2.06	1.39	1.62	0.86	1.04	0.41	3.78	31.78
73	52	4	3.88	0.83	1.60	7.26	1.39	1.88	1.24	0.27	1.36	0.23	1.14	2.18	1.44	1.68	0.85	1.08	0.49	3.94	32.74
73	52	5	3.58	0.77	1.46	6.72	1.28	1.75	1.15	0.25	1.25	0.21	1.05	1.99	1.33	1.56	0.82	1.01	0.45	3.58	30.21
73	52	6	3.57	0.77	1.48	6.66	1.30	1.66	1.15	0.25	1.23	0.24	1.03	1.93	1.32	1.52	0.79	0.97	0.45	3.52	29.80
73	52	7	3.57	0.76	1.47	6.67	1.29	1.75	1.15	0.24	1.25	0.25	1.09	1.94	1.27	1.52	0.79	0.99	0.47	3.53	30.03
73	52	8	3.66	0.78	1.50	6.85	1.30	1.78	1.16	0.27	1.24	0.27	1.12	2.01	1.36	1.57	0.83	1.05	0.43	3.68	30.86
73	52	9	3.90	0.84	1.61	7.25	1.38	1.97	1.26	0.28	1.35	0.27	1.12	2.17	1.41	1.64	0.87	1.07	0.49	3.85	32.71

TABLE 2. 1973-74 UPT - GRAMS AMINO ACID/100 GRAMS OF PEANUTS - MEAN OF TWO REPS

YR	L	V	ASP	THR	SER	GLU	PRO	GLY	ALA	CYS	VAL	MET	ILE	LEU	TYR	PHE	HIS	LYS	NH4	ARG	SUM
73	52	10	3.55	0.76	1.45	6.64	1.26	1.66	1.12	0.26	1.23	0.28	1.02	1.95	1.31	1.47	0.77	1.00	0.42	3.56	29.72
73	52	16	3.87	0.78	1.56	7.29	1.34	2.03	1.21	0.31	1.21	0.30	1.10	2.13	1.45	1.59	0.85	1.14	0.45	3.99	32.62
73	52	17	3.48	0.74	1.41	6.66	1.17	1.79	1.11	0.25	1.18	0.27	0.99	1.93	1.24	1.52	0.84	1.04	0.56	3.58	29.76
73	52	18	3.03	0.66	1.26	5.75	1.08	1.60	0.99	0.22	1.04	0.25	0.90	1.72	1.10	1.30	0.74	0.87	0.42	3.07	26.00
73	52	19	3.55	0.71	1.46	6.73	1.22	1.90	1.11	0.30	1.10	0.29	1.00	1.94	1.30	1.46	0.79	1.05	0.37	3.76	30.04
73	52	20	2.92	0.60	1.23	5.50	1.03	1.64	0.94	0.25	0.93	0.23	0.83	1.63	1.08	1.19	0.66	0.87	0.40	3.05	25.00
73	52	21	3.78	0.82	1.53	7.11	1.29	1.75	1.21	0.24	1.36	0.27	1.08	2.06	1.42	1.66	0.91	1.07	0.62	3.70	31.87
73	52	22	3.19	0.69	1.32	6.00	1.13	1.65	1.05	0.24	1.10	0.22	0.93	1.79	1.23	1.36	0.76	0.93	0.46	3.20	27.25
73	52	23	3.01	0.66	1.28	5.65	1.09	1.58	0.98	0.23	1.07	0.22	0.91	1.72	1.15	1.28	0.71	0.88	0.39	2.97	25.77
73	52	24	3.49	0.76	1.42	6.55	1.19	1.85	1.12	0.21	1.18	0.24	0.99	1.91	1.32	1.50	0.83	1.04	0.56	3.44	29.62
73	52	25	3.41	0.71	1.40	6.40	1.19	1.85	1.09	0.27	1.09	0.23	0.97	1.92	1.25	1.42	0.77	1.05	0.40	3.55	29.96
73	52	26	3.31	0.75	1.40	6.24	1.18	1.59	1.08	0.25	1.22	0.24	0.96	1.82	1.20	1.42	0.82	0.95	0.46	3.22	28.12
73	52	31	3.39	0.71	1.37	6.43	1.20	1.73	1.10	0.25	1.15	0.23	0.99	1.89	1.26	1.45	0.77	0.97	0.41	3.52	28.83
73	61	1	3.98	0.82	1.62	7.29	1.39	1.81	1.27	0.27	1.36	0.26	1.11	2.19	1.50	1.72	0.90	1.10	0.57	3.86	33.03
73	61	2	3.91	0.81	1.58	7.16	1.33	1.79	1.25	0.23	1.33	0.24	1.09	2.18	1.51	1.63	0.92	1.12	0.52	3.61	32.20
73	61	3	3.90	0.81	1.57	7.09	1.37	1.80	1.26	0.22	1.33	0.22	1.11	2.17	1.51	1.62	0.91	1.15	0.57	3.83	32.45
73	61	4	3.96	0.82	1.60	7.24	1.38	1.83	1.27	0.24	1.35	0.24	1.13	2.22	1.57	1.66	0.92	1.15	0.57	3.86	33.03
73	61	5	3.79	0.79	1.54	6.96	1.30	1.79	1.22	0.20	1.29	0.21	1.08	2.10	1.46	1.59	0.91	1.11	0.45	3.62	31.42
73	61	6	3.77	0.80	1.56	6.85	1.31	1.75	1.23	0.22	1.29	0.22	1.07	2.10	1.45	1.58	0.92	1.12	0.53	3.63	31.40
73	61	7	3.85	0.80	1.55	7.05	1.33	1.77	1.24	0.24	1.31	0.23	1.09	2.16	1.49	1.63	0.90	1.11	0.51	3.74	32.00
73	61	8	3.93	0.80	1.58	7.18	1.37	1.83	1.28	0.29	1.40	0.19	1.10	2.18	1.50	1.65	0.93	1.12	0.54	3.79	32.65
73	61	9	3.61	0.78	1.52	6.63	1.24	1.79	1.18	0.23	1.26	0.26	1.02	2.05	1.43	1.52	0.89	1.03	0.50	3.33	30.28
73	61	10	3.47	0.76	1.48	6.31	1.19	1.62	1.14	0.21	1.22	0.25	0.99	1.93	1.36	1.44	0.84	0.98	0.51	3.24	28.95
73	61	16	3.51	0.69	1.38	6.53	1.18	1.93	1.13	0.22	1.15	0.20	1.01	1.96	1.31	1.42	0.87	1.16	0.48	3.46	29.60
73	61	17	3.38	0.71	1.33	6.35	1.13	1.77	1.10	0.21	1.19	0.20	0.97	1.93	1.31	1.43	0.82	0.99	0.44	3.27	28.55
73	61	18	3.38	0.71	1.32	6.27	1.14	1.76	1.10	0.15	1.19	0.25	0.99	1.92	1.31	1.44	0.85	1.06	0.44	3.13	28.43
73	61	19	3.58	0.70	1.38	6.61	1.22	1.95	1.14	0.18	1.16	0.22	1.04	2.02	1.34	1.49	0.85	1.14	0.52	3.54	30.07
73	61	20	3.57	0.70	1.39	6.66	1.22	1.92	1.14	0.25	1.16	0.24	1.02	2.04	1.36	1.51	0.87	1.14	0.52	3.64	30.36
73	61	21	3.83	0.81	1.57	7.07	1.32	1.77	1.25	0.21	1.39	0.20	1.08	2.13	1.45	1.65	0.93	1.02	0.46	3.54	31.67
73	61	22	3.50	0.74	1.34	6.47	1.23	1.75	1.16	0.20	1.24	0.20	1.01	1.99	1.33	1.49	0.81	1.04	0.57	3.45	29.50
73	61	23	3.52	0.73	1.40	6.49	1.20	1.79	1.14	0.18	1.27	0.23	1.03	1.99	1.37	1.45	0.83	1.02	0.46	3.44	29.54
73	61	24	3.52	0.74	1.38	6.51	1.22	1.99	1.15	0.20	1.25	0.20	1.02	2.00	1.32	1.54	0.83	1.03	0.53	3.46	29.78
73	61	25	3.33	0.67	1.32	6.14	1.13	1.91	1.07	0.22	1.09	0.20	0.95	1.91	1.25	1.39	0.76	1.02	0.55	3.32	28.23
73	61	26	3.52	0.76	1.40	6.53	1.22	1.66	1.15	0.20	1.33	0.21	1.02	2.00	1.38	1.51	0.83	0.99	0.53	3.35	29.61
73	64	1	3.86	0.79	1.56	7.11	1.35	1.77	1.22	0.28	1.33	0.27	1.08	2.13	1.48	1.67	0.92	1.07	0.49	3.84	32.22
73	64	2	3.79	0.79	1.53	6.98	1.34	1.77	1.21	0.27	1.32	0.27	1.07	2.12	1.49	1.66	0.91	1.05	0.50	3.77	31.85
73	64	3	3.72	0.78	1.50	6.83	1.30	1.69	1.19	0.25	1.28	0.22	1.07	2.07	1.46	1.61	0.89	1.05	0.53	4.03	31.48
73	64	4	4.09	0.85	1.66	7.59	1.44	1.89	1.32	0.27	1.40	0.27	1.16	2.31	1.57	1.80	0.96	1.15	0.73	4.15	34.62
73	64	5	3.90	0.81	1.59	7.17	1.38	1.78	1.25	0.26	1.33	0.27	1.10	2.16	1.53	1.67	0.92	1.07	0.51	3.94	32.66
73	64	6	3.97	0.84	1.62	7.36	1.38	1.81	1.30	0.27	1.37	0.26	1.13	2.23	1.49	1.80	0.97	1.15	0.69	3.91	33.57
73	64	7	4.26	0.89	1.72	8.01	1.48	1.97	1.37	0.27	1.45	0.31	1.24	2.44	1.66	1.92	0.98	1.18	0.84	4.32	36.29
73	64	8	3.96	0.83	1.61	7.34	1.40	1.84	1.26	0.26	1.35	0.26	1.13	2.22	1.48	1.76	0.95	1.10	0.67	4.07	33.49
73	64	9	3.47	0.75	1.41	6.35	1.22	1.67	1.16	0.23	1.19	0.25	1.00	1.96	1.34	1.46	0.81	1.00	0.56	3.42	29.26
73	64	10	3.69	0.79	1.50	6.94	1.29	1.73	1.21	0.26	1.29	0.27	1.07	2.05	1.41	1.60	0.86	1.03	0.60	3.70	31.29
73	64	16	3.65	0.72	1.47	6.81	1.26	1.92	1.16	0.25	1.14	0.34	1.16	2.10	1.42	1.56	0.86	1.06	0.50	3.71	31.11
73	64	17	3.34	0.70	1.31	6.18	1.17	1.63	1.09	0.20	1.16	0.18	0.95	1.87	1.34	1.49	0.85	1.00	0.52	3.37	28.37
73	64	18	3.36	0.72	1.34	6.20	1.17	1.69	1.11	0.27	1.17	0.24	0.99	1.93	1.33	1.46	0.83	0.98	0.61	3.47	28.84
73	64	19	3.73	0.75	1.51	6.91	1.28	1.93	1.19	0.26	1.16	0.33	1.19	2.16	1.44	1.60	0.88	1.11	0.45	3.81	31.69

TABLE 2. 1973-74 UPT - GRAMS AMINO ACID/100 GRAMS OF PEANUTS - MEAN OF TWO REPS

YR	L	V	ASP	THR	SER	GLU	PRO	GLY	ALA	CYS	VAL	MET	ILE	LEU	TYR	PHE	HIS	LYS	NH4	ARG	SUM
73	64	20	3.71	0.73	1.48	6.92	1.29	1.92	1.18	0.29	1.15	0.34	1.01	2.07	1.45	1.58	0.91	1.16	0.54	3.91	31.64
73	64	21	3.78	0.80	1.50	7.02	1.35	1.72	1.21	0.21	1.39	0.22	1.07	2.11	1.51	1.75	0.93	1.03	0.55	3.65	31.80
73	64	22	3.53	0.74	1.39	6.55	1.23	1.70	1.14	0.24	1.22	0.25	1.00	1.93	1.35	1.60	0.88	1.02	0.53	3.58	29.93
73	64	23	3.77	0.78	1.54	6.95	1.34	1.85	1.22	0.25	1.28	0.26	1.05	2.09	1.50	1.67	0.90	1.07	0.51	3.72	31.78
73	64	24	3.56	0.74	1.44	6.61	1.24	1.85	1.14	0.24	1.23	0.23	1.00	2.01	1.35	1.61	0.90	1.04	0.49	3.55	30.23
73	64	25	3.63	0.73	1.46	6.69	1.27	1.88	1.17	0.27	1.16	0.21	1.01	2.04	1.43	1.61	0.86	1.09	0.50	3.67	30.69
73	64	26	3.31	0.73	1.34	6.18	1.17	1.53	1.09	0.23	1.23	0.23	0.94	1.85	1.34	1.50	0.82	0.94	0.52	3.20	28.15
73	71	1	3.75	0.78	1.51	6.81	1.30	1.74	1.21	0.22	1.31	0.22	1.07	2.07	1.44	1.63	0.87	1.04	0.44	3.63	31.05
73	71	2	3.73	0.77	1.46	6.76	1.30	1.77	1.21	0.16	1.34	0.23	1.08	2.09	1.41	1.56	0.85	1.07	0.56	3.59	30.95
73	71	3	3.59	0.75	1.42	6.54	1.24	1.70	1.17	0.21	1.28	0.23	1.04	1.98	1.36	1.56	0.83	1.03	0.53	3.41	29.87
73	71	4	3.64	0.75	1.38	6.62	1.28	1.71	1.17	0.19	1.33	0.21	1.06	2.04	1.37	1.59	0.82	1.05	0.55	3.56	30.31
73	71	5	3.66	0.77	1.47	6.65	1.24	1.74	1.18	0.21	1.28	0.20	1.04	2.03	1.41	1.60	0.85	1.03	0.41	3.52	30.31
73	71	6	3.63	0.76	1.42	6.55	1.28	1.78	1.19	0.18	1.32	0.23	1.05	2.01	1.37	1.59	0.83	1.06	0.53	3.49	30.28
73	71	7	3.75	0.77	1.45	6.80	1.29	1.75	1.21	0.20	1.34	0.23	1.08	2.10	1.43	1.61	0.85	1.06	0.53	3.68	31.16
73	71	8	3.94	0.82	1.54	6.93	1.36	1.87	1.27	0.19	1.41	0.22	1.12	2.19	1.49	1.71	0.91	1.09	0.47	3.76	32.30
73	71	9	3.41	0.73	1.35	6.24	1.16	1.69	1.13	0.20	1.22	0.22	1.01	1.92	1.30	1.46	0.85	1.05	0.44	3.27	28.68
73	71	10	3.50	0.74	1.39	6.41	1.21	1.65	1.16	0.19	1.26	0.26	1.04	1.96	1.36	1.48	0.86	1.07	0.41	3.33	29.30
73	71	25	3.34	0.69	1.30	6.06	1.14	1.74	1.11	0.17	1.11	0.17	0.98	1.88	1.27	1.40	0.82	1.06	0.41	3.33	27.98
73	72	1	3.79	0.79	1.52	6.91	1.29	1.73	1.23	0.23	1.31	0.23	1.07	2.09	1.42	1.65	0.87	1.05	0.40	3.70	31.26
73	72	2	3.58	0.74	1.40	6.52	1.23	1.73	1.16	0.20	1.30	0.23	1.05	2.01	1.39	1.58	0.83	1.01	0.52	3.39	29.89
73	72	3	3.72	0.76	1.42	6.75	1.29	1.72	1.21	0.15	1.34	0.22	1.09	2.08	1.41	1.60	0.84	1.05	0.54	3.56	30.76
73	72	4	3.69	0.77	1.44	6.68	1.30	1.72	1.21	0.19	1.32	0.21	1.07	2.04	1.36	1.61	0.84	1.05	0.52	3.56	30.59
73	72	5	3.66	0.76	1.42	6.60	1.29	1.70	1.19	0.20	1.31	0.21	1.06	2.04	1.40	1.62	0.81	1.02	0.52	3.54	30.36
73	72	6	3.68	0.76	1.40	6.66	1.27	1.67	1.19	0.20	1.33	0.24	1.07	2.05	1.39	1.58	0.81	1.03	0.53	3.60	30.46
73	72	7	3.68	0.76	1.43	6.67	1.26	1.72	1.19	0.20	1.31	0.22	1.08	2.05	1.42	1.59	0.84	1.02	0.50	3.54	30.48
73	72	8	3.76	0.77	1.46	6.93	1.28	1.74	1.22	0.21	1.36	0.21	1.09	2.10	1.40	1.66	0.85	1.03	0.47	3.56	30.98
73	72	9	3.11	0.68	1.25	5.70	1.06	1.57	1.05	0.18	1.13	0.22	0.93	1.75	1.20	1.31	0.79	0.97	0.38	2.94	26.22
73	72	10	3.55	0.76	1.41	6.51	1.22	1.65	1.17	0.22	1.29	0.23	1.04	1.98	1.39	1.47	0.87	1.06	0.45	3.42	29.67
73	72	25	3.27	0.67	1.29	5.97	1.12	1.68	1.08	0.19	1.10	0.18	0.96	1.85	1.25	1.36	0.80	1.01	0.43	3.25	27.47
74	11	2	3.43	0.74	1.37	6.33	1.21	1.62	1.09	0.18	1.21	0.25	0.97	1.91	1.28	1.45	0.77	0.97	0.41	3.29	28.48
74	11	3	3.66	0.78	1.45	6.63	1.30	1.69	1.17	0.18	1.26	0.22	1.03	2.01	1.37	1.50	0.82	1.01	0.43	3.49	29.99
74	11	4	3.69	0.80	1.60	6.65	1.32	1.76	1.19	0.19	1.27	0.21	1.01	2.02	1.39	1.56	0.92	1.04	0.45	3.48	30.56
74	11	5	3.54	0.76	1.46	6.48	1.26	1.70	1.12	0.18	1.23	0.24	0.98	1.97	1.32	1.50	0.81	0.99	0.42	3.32	29.26
74	11	6	3.52	0.76	1.43	6.47	1.23	1.68	1.12	0.18	1.23	0.23	1.00	1.93	1.30	1.45	0.77	0.97	0.42	3.29	28.98
74	11	7	3.34	0.72	1.35	6.15	1.17	1.60	1.06	0.20	1.16	0.25	0.95	1.84	1.23	1.38	0.73	0.93	0.39	3.14	27.58
74	11	9	3.37	0.72	1.31	6.13	1.18	1.63	1.09	0.18	1.17	0.23	0.96	1.87	1.22	1.29	0.72	0.94	0.40	3.11	27.51
74	11	11	3.69	0.78	1.49	6.73	1.31	1.67	1.17	0.20	1.28	0.23	1.03	2.08	1.35	1.55	0.84	1.02	0.44	3.49	30.36
74	11	12	3.42	0.73	1.32	6.18	1.23	1.59	1.10	0.15	1.22	0.21	0.97	1.88	1.28	1.34	0.74	0.96	0.42	3.22	27.97
74	11	13	3.25	0.72	1.29	6.03	1.18	1.57	1.08	0.15	1.20	0.27	1.03	1.85	1.24	1.33	0.79	0.92	0.41	3.08	27.39
74	11	14	3.60	0.77	1.42	6.53	1.28	1.67	1.15	0.21	1.26	0.24	1.04	1.98	1.33	1.48	0.78	0.96	0.48	3.38	29.56
74	11	15	3.31	0.70	1.29	6.07	1.20	1.56	1.06	0.17	1.17	0.22	0.95	1.86	1.24	1.34	0.74	0.90	0.40	3.04	27.23
74	11	19	3.28	0.66	1.26	6.01	1.17	1.63	1.05	0.16	1.06	0.19	0.93	1.80	1.17	1.19	0.68	0.94	0.47	3.16	26.81
74	11	20	3.47	0.69	1.31	6.28	1.24	1.67	1.13	0.18	1.12	0.19	0.95	1.90	1.24	1.31	0.70	0.97	0.43	3.39	28.18
74	11	21	3.56	0.75	1.39	6.49	1.33	1.56	1.14	0.17	1.30	0.25	1.01	1.96	1.34	1.43	0.78	0.94	0.43	3.31	29.15
74	11	22	3.56	0.75	1.35	6.57	1.28	1.66	1.18	0.17	1.24	0.20	1.02	2.01	1.34	1.57	0.84	1.07	0.55	3.48	29.84
74	11	23	3.30	0.69	1.31	6.06	1.22	1.65	1.06	0.17	1.14	0.22	0.94	1.81	1.20	1.24	0.68	0.89	0.39	3.06	27.04
74	11	24	3.33	0.71	1.28	6.24	1.19	1.64	1.11	0.16	1.17	0.22	0.95	1.90	1.29	1.75	0.85	1.06	0.51	3.19	28.56
74	11	25	3.29	0.67	1.26	5.97	1.19	1.69	1.07	0.15	1.08	0.19	0.94	1.83	1.21	1.30	0.70	0.95	0.39	3.13	27.00

TABLE 2. 1973-74 UPT - GRAMS AMINO ACID/100 GRAMS OF PEANUTS - MEAN OF TWO REPS

YR	L	V	ASP	THR	SER	GLU	PRO	GLY	ALA	CYS	VAL	MET	ILE	LEU	TYR	PHE	HIS	LYS	NH4	ARG	SUM
74	11	26	3.31	0.73	1.30	6.21	1.21	1.52	1.12	0.16	1.24	0.22	0.98	1.87	1.28	1.50	0.76	1.00	0.51	3.15	28.05
74	11	27	3.56	0.70	1.34	6.66	1.26	1.72	1.16	0.21	1.14	0.22	0.99	2.00	1.32	1.55	0.76	1.06	0.53	3.65	29.84
74	11	28	3.20	0.67	1.21	5.78	1.16	1.47	1.04	0.13	1.10	0.20	0.92	1.76	1.15	1.14	0.66	0.89	0.38	3.02	25.90
74	11	29	3.29	0.70	1.27	5.99	1.21	1.60	1.07	0.17	1.14	0.21	0.95	1.81	1.20	1.25	0.68	0.90	0.39	3.04	26.87
74	11	30	3.72	0.72	1.34	6.69	1.31	1.69	1.20	0.17	1.18	0.18	1.02	2.01	1.34	1.50	0.78	1.11	0.56	3.14	29.69
74	11	31	3.57	0.72	1.34	6.38	1.26	1.67	1.13	0.16	1.20	0.21	0.95	1.94	1.29	1.45	0.77	0.96	0.43	3.33	28.74
74	21	2	3.77	0.78	1.50	6.83	1.35	1.70	1.19	0.25	1.31	0.22	1.07	2.05	1.43	1.65	0.84	1.05	0.60	3.61	31.21
74	21	3	3.73	0.78	1.49	6.73	1.34	1.69	1.20	0.25	1.30	0.23	1.04	2.03	1.41	1.64	0.83	1.05	0.56	3.60	30.89
74	21	4	3.75	0.78	1.51	6.77	1.35	1.70	1.20	0.26	1.31	0.24	1.05	2.03	1.42	1.65	0.84	1.03	0.59	3.59	31.08
74	21	5	3.55	0.75	1.43	6.48	1.29	1.67	1.13	0.22	1.26	0.28	1.02	1.94	1.37	1.59	0.81	1.01	0.57	3.41	29.80
74	21	6	3.76	0.78	1.49	6.77	1.36	1.67	1.21	0.23	1.31	0.21	1.06	2.03	1.42	1.62	0.82	1.04	0.59	3.61	30.99
74	21	7	3.82	0.79	1.52	6.94	1.39	1.69	1.22	0.23	1.32	0.25	1.07	2.07	1.46	1.67	0.83	1.05	0.59	3.68	31.60
74	21	9	3.41	0.72	1.37	6.15	1.24	1.61	1.10	0.22	1.17	0.23	0.97	1.88	1.31	1.45	0.76	0.97	0.56	3.29	28.40
74	21	11	3.69	0.76	1.44	6.67	1.32	1.61	1.17	0.23	1.30	0.23	1.05	2.01	1.40	1.62	0.81	1.02	0.54	3.51	30.39
74	21	12	3.57	0.75	1.44	6.48	1.31	1.66	1.15	0.23	1.25	0.20	1.02	1.96	1.38	1.52	0.79	0.99	0.58	3.43	29.70
74	21	13	3.38	0.75	1.40	6.19	1.25	1.57	1.10	0.22	1.23	0.21	0.97	1.87	1.32	1.47	0.79	0.96	0.54	3.25	28.47
74	21	14	3.65	0.77	1.47	6.61	1.33	1.67	1.17	0.25	1.29	0.25	1.04	1.99	1.40	1.59	0.80	1.00	0.57	3.52	30.38
74	21	15	3.62	0.76	1.47	6.58	1.33	1.66	1.16	0.23	1.26	0.22	1.03	1.98	1.39	1.56	0.80	1.00	0.57	3.47	30.10
74	21	19	3.43	0.70	1.37	6.26	1.24	1.71	1.14	0.23	1.11	0.17	0.97	1.92	1.31	1.46	0.76	1.02	0.54	3.45	28.81
74	21	20	3.49	0.71	1.41	6.37	1.25	1.69	1.16	0.25	1.14	0.23	0.99	1.94	1.33	1.47	0.78	1.04	0.56	3.48	29.28
74	21	21	3.53	0.76	1.42	6.42	1.33	1.67	1.18	0.21	1.31	0.24	1.02	1.96	1.38	1.52	0.81	0.97	0.57	3.35	29.55
74	21	22	3.31	0.73	1.35	6.12	1.19	1.61	1.16	0.16	1.17	0.22	0.97	1.90	1.27	1.40	0.84	1.00	0.42	3.33	28.14
74	21	23	3.18	0.68	1.28	5.76	1.19	1.58	1.06	0.21	1.13	0.22	0.93	1.78	1.24	1.35	0.72	0.94	0.51	3.00	26.74
74	21	24	3.35	0.73	1.34	6.20	1.19	1.68	1.17	0.20	1.17	0.21	0.95	1.90	1.29	1.43	0.83	0.96	0.44	3.27	28.33
74	21	25	3.24	0.67	1.29	5.89	1.19	1.72	1.10	0.21	1.08	0.23	0.93	1.81	1.25	1.36	0.72	0.97	0.52	3.24	27.42
74	21	26	3.51	0.78	1.36	6.53	1.34	1.55	1.15	0.20	1.38	0.29	1.05	2.03	1.34	1.61	0.84	1.04	0.51	3.54	30.05
74	21	27	3.72	0.75	1.45	6.88	1.31	1.79	1.26	0.22	1.20	0.22	1.02	2.11	1.39	1.54	0.85	1.09	0.41	3.85	31.05
74	21	28	3.21	0.69	1.32	5.87	1.19	1.51	1.08	0.18	1.13	0.20	0.93	1.81	1.23	1.38	0.75	0.95	0.54	3.20	27.16
74	21	29	3.43	0.73	1.37	6.27	1.30	1.63	1.15	0.20	1.20	0.22	0.99	1.92	1.32	1.46	0.79	1.00	0.54	3.37	28.90
74	21	30	3.56	0.72	1.39	6.46	1.26	1.70	1.19	0.21	1.15	0.23	1.00	1.99	1.33	1.45	0.85	1.06	0.44	3.67	29.66
74	21	31	3.45	0.72	1.38	6.25	1.29	1.65	1.13	0.23	1.18	0.22	0.98	1.92	1.33	1.51	0.78	0.98	0.55	3.37	28.94
74	31	2	3.28	0.71	1.34	6.05	1.16	1.61	1.07	0.22	1.16	0.22	0.96	1.84	1.27	1.35	0.77	0.99	0.48	3.18	27.65
74	31	3	3.43	0.73	1.41	6.33	1.21	1.65	1.12	0.20	1.19	0.21	1.00	1.93	1.31	1.44	0.81	1.00	0.55	3.31	28.85
74	31	4	3.37	0.72	1.37	6.21	1.18	1.64	1.10	0.21	1.20	0.29	0.97	1.92	1.30	1.44	0.78	1.00	0.50	3.26	28.46
74	31	5	3.45	0.74	1.42	6.36	1.20	1.68	1.12	0.23	1.22	0.23	1.01	1.94	1.34	1.50	0.85	1.04	0.54	3.35	29.23
74	31	6	3.27	0.71	1.33	6.00	1.16	1.58	1.06	0.27	1.17	0.21	0.95	1.81	1.24	1.44	0.77	0.97	0.61	3.15	27.68
74	31	7	3.33	0.71	1.36	6.13	1.16	1.62	1.09	0.19	1.17	0.21	0.96	1.88	1.29	1.41	0.81	1.00	0.51	3.21	28.03
74	31	9	3.15	0.67	1.29	5.83	1.08	1.69	1.03	0.30	1.08	0.23	0.92	1.80	1.23	1.33	0.76	0.94	0.51	3.04	26.88
74	31	11	3.33	0.70	1.36	6.19	1.19	1.52	1.08	0.23	1.15	0.19	0.96	1.87	1.28	1.37	0.79	0.99	0.51	3.28	28.00
74	31	12	3.23	0.69	1.35	6.01	1.13	1.64	1.05	0.23	1.16	0.23	0.94	1.85	1.29	1.38	0.79	0.94	0.49	3.13	27.52
74	31	13	3.11	0.69	1.30	5.83	1.08	1.53	1.02	0.20	1.17	0.21	0.90	1.77	1.22	1.35	0.77	0.89	0.50	2.98	26.54
74	31	14	3.36	0.73	1.42	6.24	1.18	1.68	1.10	0.20	1.20	0.20	0.98	1.87	1.29	1.46	0.82	1.02	0.53	3.31	28.61
74	31	15	2.96	0.65	1.23	5.53	1.04	1.52	0.97	0.26	1.07	0.19	0.87	1.67	1.12	1.22	0.71	0.89	0.44	2.79	25.16
74	31	19	3.21	0.65	1.29	5.98	1.09	1.76	1.03	0.24	1.03	0.20	0.92	1.81	1.22	1.33	0.74	1.01	0.47	3.23	27.22
74	31	20	3.08	0.62	1.26	5.75	1.08	1.77	0.99	0.23	0.99	0.18	0.89	1.77	1.20	1.28	0.76	1.00	0.48	3.15	26.46
74	31	21	3.36	0.74	1.39	6.23	1.18	1.63	1.10	0.22	1.25	0.23	0.97	1.91	1.35	1.50	0.84	0.95	0.50	3.19	28.56
74	31	22	3.30	0.71	1.34	6.23	1.12	1.73	1.07	0.22	1.15	0.21	0.94	1.87	1.21	1.44	0.79	1.01	0.49	3.23	28.06
74	31	23	3.03	0.67	1.27	5.61	1.04	1.67	0.99	0.19	1.10	0.21	0.89	1.75	1.22	1.28	0.75	0.96	0.46	2.93	26.00

TABLE 2. 1973-74 UPT - GRAMS AMINO ACID/100 GRAMS OF PEANUTS - MEAN OF TWO REPS

YR	L	V	ASP	THR	SER	GLU	PRO	GLY	ALA	CYS	VAL	MET	ILE	LEU	TYR	PHE	HIS	LYS	NH4	ARG	SUM
74	31	24	3.24	0.68	1.29	5.97	1.12	1.68	1.06	0.21	1.11	0.19	0.92	1.83	1.25	1.40	0.78	0.97	0.50	3.10	27.31
74	31	25	3.23	0.66	1.32	5.97	1.11	1.86	1.04	0.22	1.05	0.18	0.92	1.87	1.26	1.34	0.76	1.03	0.52	3.19	27.56
74	31	26	2.95	0.67	1.24	5.54	1.01	1.54	0.96	0.21	1.11	0.22	0.86	1.69	1.16	1.26	0.73	0.87	0.45	2.82	25.29
74	31	27	3.11	0.65	1.27	5.31	1.09	1.79	0.99	0.23	1.01	0.22	0.87	1.72	1.18	1.35	0.70	0.96	0.51	3.12	26.61
74	31	28	3.18	0.68	1.30	5.93	1.08	1.72	1.04	0.21	1.11	0.25	0.90	1.80	1.22	1.34	0.81	1.02	0.46	3.09	27.14
74	31	29	3.22	0.70	1.30	5.95	1.12	1.72	1.07	0.20	1.13	0.17	0.93	1.83	1.26	1.41	0.80	1.01	0.47	3.11	27.40
74	31	30	3.50	0.70	1.37	6.49	1.19	1.85	1.12	0.23	1.13	0.20	0.98	1.98	1.31	1.47	0.80	1.08	0.53	3.53	29.46
74	31	31	3.48	0.72	1.38	6.50	1.21	1.87	1.13	0.22	1.16	0.20	0.98	1.95	1.32	1.47	0.86	1.04	0.51	3.40	29.22
74	41	2	3.72	0.77	1.49	6.82	1.33	1.78	1.19	0.22	1.30	0.21	1.05	2.05	1.39	1.62	0.87	1.07	0.57	3.55	31.00
74	41	3	3.42	0.73	1.39	6.23	1.24	1.66	1.09	0.23	1.22	0.20	0.97	1.87	1.32	1.51	0.79	0.97	0.55	3.21	28.61
74	41	4	3.51	0.74	1.41	6.46	1.23	1.73	1.13	0.22	1.25	0.23	1.03	1.96	1.33	1.50	0.88	1.07	0.54	3.36	29.58
74	41	5	3.67	0.77	1.45	6.80	1.29	1.79	1.19	0.22	1.30	0.22	1.05	2.04	1.40	1.60	0.83	1.06	0.59	3.60	30.87
74	41	6	3.49	0.72	1.37	6.41	1.20	1.62	1.13	0.22	1.24	0.22	0.99	1.93	1.33	1.51	0.80	0.98	0.52	3.42	29.09
74	41	7	3.50	0.74	1.39	6.46	1.22	1.74	1.13	0.21	1.25	0.22	1.01	1.95	1.34	1.54	0.84	1.04	0.50	3.32	29.40
74	41	9	3.52	0.75	1.40	6.51	1.21	1.77	1.14	0.25	1.25	0.25	1.02	1.97	1.36	1.47	0.89	1.11	0.53	3.39	29.83
74	41	11	3.61	0.76	1.44	6.68	1.25	1.70	1.16	0.24	1.28	0.23	1.03	2.01	1.37	1.53	0.83	1.05	0.53	3.51	30.22
74	41	12	3.64	0.76	1.47	6.66	1.26	1.80	1.17	0.25	1.29	0.26	1.02	2.04	1.42	1.53	0.83	1.02	0.52	3.52	30.46
74	41	13	3.38	0.75	1.36	6.25	1.21	1.65	1.11	0.22	1.28	0.24	0.98	1.91	1.32	1.48	0.81	0.95	0.53	3.16	28.61
74	41	14	3.75	0.78	1.50	6.95	1.33	1.81	1.21	0.24	1.32	0.23	1.05	2.08	1.44	1.61	0.88	1.10	0.55	3.67	31.51
74	41	15	3.40	0.73	1.39	6.32	1.19	1.68	1.11	0.23	1.21	0.22	0.97	1.90	1.32	1.43	0.83	1.04	0.47	3.25	28.69
74	41	19	3.58	0.72	1.45	6.58	1.25	1.96	1.16	0.25	1.16	0.18	1.01	2.03	1.38	1.53	0.83	1.10	0.51	3.65	30.34
74	41	20	3.25	0.67	1.32	6.04	1.12	1.81	1.07	0.25	1.05	0.20	0.93	1.83	1.24	1.36	0.76	1.01	0.47	3.28	27.66
74	41	21	3.75	0.80	1.52	6.87	1.36	1.88	1.23	0.23	1.32	0.49	1.06	2.05	1.44	1.62	0.89	1.09	0.62	3.60	31.61
74	41	22	3.58	0.76	1.43	6.53	1.28	1.81	1.16	0.20	1.21	0.44	1.03	1.95	1.33	1.54	0.86	1.14	0.57	3.57	30.41
74	41	23	3.51	0.76	1.47	6.42	1.27	1.80	1.15	0.19	1.20	0.50	1.02	1.94	1.34	1.53	0.87	1.12	0.57	3.43	30.10
74	41	24	3.42	0.72	1.39	6.32	1.22	1.79	1.10	0.21	1.14	0.45	0.98	1.90	1.30	1.49	0.82	1.08	0.55	3.34	29.25
74	41	25	3.29	0.69	1.34	6.06	1.16	1.85	1.09	0.19	1.06	0.23	0.95	1.81	1.27	1.46	0.79	1.06	0.57	3.25	28.13
74	41	26	3.49	0.78	1.43	6.44	1.27	1.65	1.14	0.22	1.28	0.33	1.01	1.92	1.34	1.53	0.80	0.97	0.56	3.37	29.52
74	41	27	3.61	0.72	1.45	6.69	1.29	1.91	1.15	0.21	1.13	0.41	1.02	1.99	1.36	1.53	0.82	1.16	0.58	3.74	30.78
74	41	28	3.30	0.72	1.37	6.11	1.18	1.72	1.08	0.20	1.14	0.39	0.95	1.84	1.26	1.45	0.82	1.06	0.56	3.22	28.36
74	41	29	3.44	0.73	1.38	6.31	1.25	1.71	1.14	0.18	1.17	0.44	1.00	1.91	1.31	1.50	0.83	1.08	0.56	3.36	29.33
74	41	30	3.81	0.76	1.51	7.04	1.36	1.89	1.23	0.24	1.19	0.29	1.07	2.10	1.42	1.65	0.85	1.16	0.70	3.57	32.15
74	41	31	3.64	0.76	1.45	6.74	1.28	1.81	1.18	0.24	1.21	0.34	1.03	1.98	1.38	1.64	0.85	1.09	0.60	3.56	30.79
74	51	2	3.34	0.68	1.31	6.13	1.26	1.62	1.02	0.23	1.25	0.23	0.96	1.89	1.36	1.52	0.79	1.00	0.43	3.30	28.31
74	51	3	3.34	0.68	1.33	6.16	1.18	1.63	1.02	0.16	1.20	0.24	1.02	1.90	1.30	1.36	0.79	0.97	0.45	3.25	27.97
74	51	4	3.34	0.70	1.37	6.09	1.47	1.64	1.01	0.20	1.22	0.30	1.08	1.90	1.30	1.46	0.77	0.96	0.58	3.24	28.61
74	51	5	3.42	0.71	1.39	6.25	1.46	1.75	1.12	0.22	1.28	0.26	1.21	2.04	1.34	1.55	0.78	0.98	0.55	3.40	29.72
74	51	6	3.38	0.71	1.35	6.15	1.22	1.59	1.05	0.21	1.25	0.24	1.02	1.89	1.31	1.25	0.74	0.95	0.41	3.27	28.00
74	51	7	3.43	0.70	1.36	6.26	1.26	1.62	1.04	0.24	1.25	0.17	1.03	1.89	1.36	1.53	0.80	1.00	0.40	3.40	28.74
74	51	9	3.24	0.63	1.23	5.82	1.13	1.75	1.03	0.26	1.12	0.23	0.89	1.79	1.27	1.33	0.75	0.99	0.37	3.12	26.96
74	51	11	3.47	0.72	1.37	6.23	1.25	1.58	1.07	0.26	1.27	0.28	1.14	1.99	1.34	1.43	0.76	0.99	0.49	3.40	29.05
74	51	12	3.39	0.69	1.36	6.31	1.32	1.80	1.13	0.28	1.28	0.22	0.97	1.89	1.31	1.45	0.83	1.01	0.44	3.39	29.07
74	51	13	3.03	0.66	1.25	5.60	1.09	1.62	1.04	0.25	1.22	0.21	0.87	1.69	1.22	1.36	0.77	0.90	0.39	2.94	26.13
74	51	14	3.56	0.73	1.39	6.48	1.33	1.71	1.08	0.26	1.31	0.18	1.07	1.94	1.39	1.51	0.82	1.03	0.46	3.54	29.78
74	51	15	3.33	0.69	1.33	6.07	1.25	1.82	1.16	0.27	1.24	0.29	0.87	1.79	1.36	1.48	0.81	0.98	0.39	3.15	28.31
74	51	19	3.39	0.65	1.34	6.20	1.24	1.78	1.03	0.19	1.07	0.20	0.98	1.93	1.21	1.25	0.71	0.96	0.30	3.51	27.93
74	51	20	3.42	0.65	1.32	6.25	1.23	1.76	1.02	0.18	1.10	0.14	0.99	1.94	1.29	1.36	0.76	1.01	0.37	3.53	28.33
74	51	21	3.38	0.71	1.35	6.14	1.21	1.59	1.05	0.24	1.20	0.18	0.93	1.86	1.38	1.40	0.81	0.94	0.39	3.27	28.02

TABLE 2. 1973-74 UPT - GRAMS AMINO ACID/100 GRAMS OF PEANUTS - MEAN OF TWO REPS

YR	L	V	ASP	THR	SER	GLU	PRO	GLY	ALA	CYS	VAL	MET	ILE	LEU	TYR	PHE	HIS	LYS	NH4	ARG	SUM
74	51	22	3.25	0.67	1.29	5.95	1.18	1.60	1.00	0.14	1.14	0.19	0.97	1.86	1.25	1.38	0.80	0.97	0.35	3.28	27.27
74	51	23	3.14	0.66	1.29	5.70	1.33	1.66	0.98	0.22	1.16	0.24	1.03	1.83	1.27	1.33	0.73	0.94	0.54	3.07	27.12
74	51	25	3.21	0.65	1.31	5.91	1.20	1.82	1.00	0.22	1.06	0.25	1.03	1.89	1.27	1.37	0.71	0.95	0.47	3.23	27.57
74	51	27	3.21	0.62	1.24	5.92	1.12	1.68	0.98	0.19	1.01	0.21	0.93	1.83	1.15	1.08	0.63	0.91	0.29	3.28	26.29
74	51	28	3.18	0.65	1.26	5.92	1.33	1.63	0.96	0.24	1.12	0.21	0.97	1.81	1.26	1.38	0.71	0.89	0.47	3.23	27.23
74	51	29	3.41	0.69	1.30	6.24	1.32	1.68	1.06	0.15	1.18	0.15	1.02	1.96	1.28	1.47	0.81	0.99	0.31	3.36	28.36
74	51	30	3.41	0.64	1.29	6.22	1.23	1.69	1.03	0.19	1.08	0.19	0.99	1.93	1.24	1.30	0.72	0.99	0.31	3.47	27.93
74	51	31	3.54	0.71	1.39	6.48	1.27	1.79	1.08	0.21	1.18	0.24	1.20	2.06	1.31	1.41	0.72	0.90	0.46	3.49	29.45
74	52	2	3.79	0.79	1.53	6.98	1.35	1.80	1.21	0.24	1.33	0.27	1.08	2.07	1.43	1.69	0.85	1.06	0.62	3.68	31.80
74	52	3	3.78	0.80	1.57	6.90	1.35	1.79	1.21	0.24	1.30	0.27	1.06	2.06	1.46	1.67	0.85	1.06	0.59	3.65	31.61
74	52	4	3.76	0.80	1.57	6.84	1.35	1.82	1.22	0.23	1.31	0.20	1.06	2.06	1.42	1.67	0.86	1.07	0.63	3.61	31.49
74	52	5	3.55	0.76	1.44	6.54	1.26	1.75	1.15	0.21	1.26	0.23	1.03	1.95	1.36	1.60	0.81	1.02	0.65	3.45	30.02
74	52	6	3.64	0.76	1.47	6.69	1.29	1.73	1.17	0.23	1.28	0.25	1.04	1.99	1.34	1.62	0.82	1.03	0.60	3.46	30.38
74	52	7	3.85	0.80	1.55	7.06	1.38	1.80	1.23	0.22	1.33	0.24	1.09	2.12	1.41	1.70	0.85	1.08	0.64	3.74	32.10
74	52	9	3.31	0.72	1.37	6.11	1.16	1.72	1.08	0.23	1.17	0.27	0.95	1.85	1.28	1.44	0.77	0.97	0.61	3.19	28.23
74	52	11	3.63	0.76	1.47	6.69	1.28	1.69	1.16	0.25	1.27	0.33	1.04	1.99	1.40	1.60	0.82	1.03	0.63	3.59	30.64
74	52	12	3.55	0.75	1.45	6.51	1.28	1.69	1.14	0.26	1.24	0.24	1.00	1.95	1.38	1.53	0.80	0.99	0.57	3.47	29.80
74	52	13	3.27	0.73	1.33	6.07	1.18	1.51	1.06	0.22	1.23	0.26	0.94	1.81	1.26	1.42	0.76	0.93	0.54	3.17	27.70
74	52	14	3.81	0.80	1.55	7.02	1.36	1.80	1.22	0.25	1.35	0.29	1.09	2.08	1.46	1.71	0.85	1.06	0.63	3.70	32.04
74	52	15	3.49	0.75	1.47	6.43	1.25	1.76	1.13	0.25	1.25	0.23	1.01	1.94	1.37	1.56	0.85	1.01	0.62	3.36	29.75
74	52	19	3.55	0.72	1.45	6.52	1.25	1.93	1.14	0.25	1.14	0.26	1.00	1.98	1.34	1.52	0.79	1.08	0.60	3.61	30.16
74	52	20	3.46	0.70	1.44	6.40	1.21	1.92	1.11	0.25	1.12	0.27	0.99	1.93	1.29	1.47	0.82	1.10	0.58	3.54	29.62
74	52	21	3.49	0.76	1.44	6.40	1.27	1.70	1.14	0.16	1.28	0.23	1.01	1.94	1.37	1.56	0.81	0.97	0.57	3.34	29.45
74	52	22	3.29	0.72	1.40	6.08	1.15	1.76	1.08	0.20	1.16	0.26	0.95	1.85	1.29	1.51	0.81	0.99	0.56	3.19	28.27
74	52	23	3.63	0.79	1.53	6.70	1.31	1.87	1.19	0.21	1.28	0.27	1.05	2.02	1.40	1.59	0.84	1.09	0.61	3.60	30.98
74	52	24	3.23	0.69	1.32	5.93	1.14	1.72	1.05	0.17	1.13	0.27	0.91	1.80	1.26	1.43	0.76	0.97	0.55	3.12	27.44
74	52	25	3.41	0.71	1.46	6.24	1.21	1.96	1.11	0.21	1.11	0.24	0.97	1.90	1.31	1.46	0.81	1.04	0.58	3.47	29.11
74	52	26	3.25	0.73	1.36	6.10	1.16	1.61	1.06	0.19	1.21	0.30	0.94	1.82	1.29	1.46	0.78	0.95	0.55	3.13	27.91
74	52	27	3.43	0.69	1.39	6.37	1.21	1.82	1.08	0.24	1.09	0.27	0.96	1.91	1.30	1.45	0.75	1.03	0.57	3.52	29.08
74	52	28	3.45	0.74	1.43	6.39	1.20	1.76	1.12	0.20	1.19	0.23	0.99	1.93	1.33	1.52	0.80	1.02	0.60	3.44	29.35
74	52	29	3.33	0.73	1.39	6.13	1.20	1.75	1.09	0.19	1.17	0.20	0.95	1.85	1.29	1.48	0.79	1.00	0.55	3.25	28.35
74	52	30	3.56	0.71	1.45	6.63	1.24	1.84	1.13	0.26	1.13	0.28	0.99	1.99	1.35	1.52	0.79	1.05	0.57	3.62	30.09
74	52	31	3.63	0.75	1.48	6.70	1.31	1.92	1.16	0.21	1.21	0.26	1.01	2.02	1.39	1.61	0.82	1.02	0.60	3.58	30.59
74	61	2	3.81	0.80	1.54	7.09	1.39	1.81	1.23	0.22	1.30	0.23	1.04	2.12	1.49	1.90	0.94	1.14	0.58	3.94	32.59
74	61	3	3.89	0.80	1.56	7.15	1.43	1.85	1.26	0.19	1.38	0.20	1.11	2.19	1.49	1.74	0.96	1.13	0.61	2.59	31.54
74	61	4	3.98	0.82	1.58	7.34	1.45	1.80	1.27	0.20	1.37	0.22	1.11	2.19	1.46	1.67	0.92	1.12	0.61	3.19	32.31
74	61	5	3.99	0.82	1.53	7.40	1.46	1.86	1.28	0.18	1.41	0.23	1.12	2.22	1.48	1.80	0.95	1.18	0.60	3.87	33.38
74	61	6	3.87	0.81	1.58	7.10	1.43	1.76	1.23	0.20	1.31	0.31	1.32	2.27	1.35	1.10	0.64	0.86	0.61	4.25	32.01
74	61	7	3.99	0.81	1.57	7.39	1.47	1.82	1.26	0.21	1.34	0.35	1.35	2.33	1.42	1.28	0.65	0.88	0.60	4.41	33.11
74	61	9	3.50	0.75	1.44	6.56	1.27	1.71	1.14	0.20	1.21	0.30	1.10	2.07	1.24	0.97	0.63	0.83	0.57	3.79	29.28
74	61	13	3.50	0.76	1.43	6.61	1.28	1.64	1.14	0.19	1.25	0.24	1.00	1.99	1.33	1.28	0.73	0.90	0.63	3.83	29.73
74	61	14	3.80	0.79	1.51	7.06	1.40	1.76	1.20	0.21	1.30	0.35	1.27	2.23	1.34	1.14	0.62	0.87	0.59	4.22	31.65
74	61	19	3.61	0.72	1.48	6.74	1.34	1.92	1.14	0.22	1.13	0.33	1.23	2.14	1.31	1.33	0.73	0.99	0.59	4.16	31.10
74	61	20	3.73	0.75	1.63	6.87	1.36	1.94	1.18	0.23	1.16	0.33	1.29	2.24	1.30	1.11	0.71	0.91	0.61	4.25	31.59
74	61	21	3.78	0.83	1.66	6.92	1.44	1.79	1.23	0.22	1.36	0.31	1.24	2.22	1.42	1.30	0.78	0.90	0.63	4.13	32.17
74	61	22	3.41	0.73	1.37	6.34	1.25	1.72	1.09	0.18	1.16	0.31	1.20	2.05	1.24	1.12	0.64	0.89	0.54	3.79	29.02
74	61	23	3.51	0.74	1.49	6.53	1.32	1.79	1.12	0.21	1.19	0.34	1.22	2.10	1.32	1.33	0.73	0.94	0.57	3.86	30.31
74	61	24	3.56	0.76	1.54	6.61	1.33	1.92	1.14	0.21	1.19	0.31	1.21	2.11	1.29	1.22	0.78	0.95	0.59	3.91	30.64

TABLE 2. 1973-74 UPT - GRAMS AMINO ACID/100 GRAMS OF PEANUTS - MEAN OF TWO REPS

YR	L	V	ASP	THR	SER	GLU	PRO	GLY	ALA	CYS	VAL	MET	ILE	LEU	TYR	PHE	HIS	LYS	NH4	ARG	SUM
74	61	25	3.45	0.71	1.42	6.35	1.28	1.87	1.10	0.17	1.09	0.30	1.18	2.06	1.18	1.18	0.62	0.88	0.56	3.89	29.29
74	61	26	3.36	0.74	1.38	6.28	1.24	1.58	1.08	0.17	1.22	0.31	1.08	1.95	1.22	1.18	0.68	0.86	0.52	3.62	28.49
74	63	2	3.79	0.79	1.53	6.94	1.35	1.79	1.22	0.22	1.32	0.29	1.08	2.07	1.44	1.66	0.86	1.09	0.61	3.65	31.69
74	63	3	3.90	0.81	1.57	7.10	1.43	1.81	1.26	0.20	1.35	0.29	1.11	2.12	1.49	1.72	0.88	1.12	0.63	3.82	32.61
74	63	4	3.92	0.82	1.60	7.13	1.42	1.85	1.26	0.22	1.34	0.22	1.11	2.13	1.48	1.71	0.90	1.13	0.64	3.89	32.77
74	63	5	3.84	0.79	1.54	7.01	1.40	1.81	1.24	0.20	1.32	0.30	1.09	2.10	1.48	1.69	0.89	1.15	0.62	3.82	32.31
74	63	6	3.72	0.79	1.51	6.75	1.31	1.73	1.20	0.21	1.30	0.20	1.06	2.03	1.41	1.63	0.83	1.05	0.62	3.58	30.93
74	63	7	3.87	0.80	1.56	7.08	1.40	1.81	1.24	0.19	1.34	0.25	1.10	2.11	1.46	1.72	0.86	1.07	0.63	3.73	32.23
74	63	9	3.58	0.77	1.46	6.52	1.27	1.79	1.16	0.23	1.24	0.28	1.02	1.98	1.39	1.55	0.81	1.00	0.58	3.47	30.12
74	63	13	3.42	0.75	1.40	6.34	1.23	1.65	1.11	0.19	1.27	0.27	0.98	1.89	1.32	1.50	0.80	0.93	0.55	3.26	28.88
74	63	14	3.99	0.82	1.60	7.28	1.43	1.87	1.28	0.24	1.38	0.25	1.13	2.16	1.52	1.75	0.87	1.09	0.65	3.93	33.25
74	63	19	3.56	0.71	1.44	6.56	1.28	2.08	1.13	0.21	1.15	0.23	1.01	1.99	1.34	1.51	0.79	1.09	0.57	3.59	30.24
74	63	20	3.70	0.74	1.52	6.82	1.29	1.97	1.18	0.22	1.17	0.25	1.02	2.06	1.41	1.55	0.81	1.08	0.60	3.77	31.16
74	63	21	3.75	0.80	1.51	6.93	1.37	1.71	1.23	0.16	1.36	0.27	1.08	2.08	1.45	1.67	0.85	1.00	0.60	3.67	31.49
74	63	22	3.36	0.72	1.35	6.27	1.22	1.76	1.10	0.18	1.17	0.22	0.97	1.85	1.29	1.48	0.79	1.01	0.54	3.28	28.58
74	63	23	3.31	0.71	1.38	6.12	1.19	1.73	1.08	0.16	1.15	0.22	0.96	1.84	1.29	1.44	0.77	1.01	0.53	3.26	28.14
74	63	24	3.40	0.72	1.38	6.27	1.21	1.85	1.11	0.21	1.17	0.24	0.97	1.90	1.33	1.48	0.79	0.99	0.52	3.27	28.81
74	63	25	3.51	0.72	1.41	6.43	1.25	1.98	1.13	0.16	1.15	0.19	1.00	1.95	1.34	1.51	0.78	1.07	0.57	3.53	29.68
74	63	26	3.24	0.73	1.33	5.95	1.20	1.54	1.08	0.18	1.26	0.28	0.95	1.85	1.25	1.43	0.79	0.91	0.58	3.20	27.75
74	71	2	3.47	0.74	1.37	6.41	1.24	1.58	1.14	0.17	1.20	0.35	1.27	2.05	1.32	1.50	0.82	0.99	0.50	3.33	29.47
74	71	3	3.46	0.74	1.38	6.39	1.27	1.59	1.14	0.19	1.19	0.32	1.24	2.06	1.31	1.48	0.82	0.98	0.45	3.32	29.32
74	71	4	3.35	0.72	1.32	6.14	1.21	1.53	1.10	0.18	1.15	0.31	1.20	1.96	1.27	1.43	0.79	0.95	0.44	3.20	28.27
74	71	5	3.35	0.73	1.35	6.16	1.22	1.55	1.13	0.17	1.17	0.29	1.17	1.96	1.29	1.43	0.81	0.98	0.49	3.22	28.47
74	71	6	3.32	0.72	1.32	6.09	1.20	1.48	1.10	0.17	1.15	0.29	1.18	1.94	1.27	1.43	0.79	0.94	0.44	3.19	28.03
74	71	7	3.09	0.69	1.25	5.75	1.10	1.44	1.03	0.16	1.11	0.30	1.11	1.83	1.19	1.33	0.78	0.91	0.43	2.95	26.48
74	71	9	3.38	0.75	1.38	6.21	1.22	1.67	1.13	0.17	1.16	0.26	1.16	2.02	1.31	1.43	0.85	1.01	0.46	3.18	28.76
74	71	11	3.56	0.75	1.41	6.67	1.28	1.56	1.15	0.21	1.21	0.37	1.30	2.13	1.33	1.51	0.82	0.98	0.52	3.42	30.19
74	71	12	3.43	0.75	1.43	6.25	1.24	1.59	1.14	0.16	1.18	0.31	1.20	2.00	1.31	1.46	0.89	0.99	0.49	3.36	29.18
74	71	13	3.25	0.72	1.33	5.93	1.15	1.57	1.12	0.18	1.17	0.25	1.07	1.87	1.29	1.43	0.83	0.95	0.42	3.13	27.66
74	71	14	3.48	0.75	1.40	6.35	1.24	1.57	1.15	0.17	1.19	0.33	1.25	2.03	1.33	1.47	0.83	1.00	0.48	3.37	29.41
74	71	15	3.44	0.74	1.38	6.33	1.24	1.62	1.14	0.14	1.20	0.23	1.11	1.98	1.32	1.46	0.83	1.00	0.43	3.33	28.93
74	72	2	3.44	0.73	1.39	6.22	1.28	1.57	1.11	0.19	1.17	0.27	1.20	2.02	1.24	1.22	0.65	0.88	0.59	3.81	28.96
74	72	3	3.26	0.70	1.32	5.87	1.21	1.50	1.05	0.18	1.11	0.25	1.15	1.91	1.19	1.17	0.64	0.85	0.52	3.55	27.43
74	72	4	3.38	0.74	1.39	6.20	1.24	1.59	1.09	0.17	1.16	0.29	1.19	1.97	1.27	1.42	0.75	0.96	0.47	3.40	28.70
74	72	5	3.50	0.77	1.42	6.54	1.28	1.67	1.16	0.15	1.24	0.29	1.17	2.06	1.32	1.63	0.87	1.04	0.47	3.34	29.93
74	72	6	3.49	0.76	1.38	6.52	1.29	1.58	1.16	0.19	1.23	0.36	1.29	2.13	1.34	1.54	0.81	1.00	0.46	3.34	29.85
74	72	7	3.37	0.73	1.34	6.24	1.23	1.55	1.11	0.18	1.18	0.33	1.21	1.98	1.30	1.51	0.81	0.97	0.45	3.23	28.73
74	72	9	3.12	0.70	1.26	5.83	1.15	1.56	1.05	0.15	1.11	0.31	1.16	1.89	1.21	1.34	0.78	0.93	0.43	2.98	26.94
74	72	11	3.36	0.72	1.35	6.10	1.23	1.50	1.08	0.19	1.15	0.28	1.18	1.97	1.19	0.99	0.58	0.85	0.54	3.63	27.88
74	72	12	3.55	0.77	1.40	6.51	1.32	1.69	1.20	0.16	1.25	0.28	1.24	2.08	1.37	1.53	0.86	1.03	0.49	3.50	30.23
74	72	13	3.29	0.75	1.42	6.06	1.22	1.57	1.12	0.14	1.20	0.30	1.19	1.95	1.30	1.41	0.88	0.96	0.45	3.18	28.39
74	72	14	3.41	0.74	1.36	6.39	1.24	1.58	1.12	0.17	1.22	0.32	1.21	2.01	1.32	1.52	0.82	0.98	0.45	3.29	29.17
74	72	15	3.32	0.73	1.39	6.11	1.26	1.60	1.10	0.18	1.19	0.33	1.26	2.05	1.33	1.45	0.86	0.96	0.48	3.20	28.80
Mean			3.51	0.74	1.41	6.47	1.25	1.72	1.13	0.22	1.22	0.25	1.03	1.97	1.33	1.49	0.81	1.00	0.51	3.45	29.53
Minimum			2.92	0.60	1.20	5.50	1.01	1.44	0.94	0.13	0.93	0.14	0.83	1.63	1.08	0.97	0.58	0.83	0.29	2.59	25.00
Maximum			4.26	0.89	1.72	8.01	1.48	2.08	1.37	0.31	1.45	0.50	1.35	2.44	1.66	1.92	0.98	1.18	0.84	4.41	36.29
C.V.			6.70	6.32	6.89	6.60	7.28	6.58	6.43	16.4	7.32	20.2	8.87	6.32	6.82	9.46	7.90	6.81	14.9	8.13	6.23

TABLE 3. 1973-74 UPT % OF TOTAL (GRAMS AMINO ACID/100 GRAMS OF AMINO ACID) - MEAN OF TWO REPS

YR	L	V	ASP	THR	SER	GLU	PRO	GLY	ALA	CYS	VAL	MET	ILE	LEU	TYR	PHE	HIS	LYS	NH4	ARG
73	11	1	11.90	2.52	4.77	21.89	4.12	5.56	3.87	0.77	4.20	0.73	3.35	6.64	4.78	5.48	2.93	3.42	1.43	11.62
73	11	2	11.84	2.55	4.77	21.98	4.11	5.68	3.85	0.68	4.23	0.73	3.39	6.60	4.71	5.49	2.99	3.42	1.46	11.50
73	11	3	11.81	2.51	4.81	21.71	4.19	5.72	3.78	0.73	4.22	0.64	3.54	6.54	4.75	5.44	3.01	3.47	1.70	11.62
73	11	4	11.89	2.50	4.76	22.00	4.16	5.54	3.83	0.78	4.20	0.76	3.35	6.58	4.63	5.45	2.92	3.42	1.76	11.45
73	11	5	11.89	2.49	4.74	21.85	4.16	5.47	3.86	0.77	4.20	0.62	3.37	6.72	4.80	5.45	2.93	3.39	1.65	11.64
73	11	6	11.82	2.54	4.83	21.73	4.14	5.64	3.83	0.75	4.26	0.77	3.37	6.54	4.59	5.49	3.01	3.52	1.69	11.49
73	11	7	11.90	2.49	4.75	21.94	4.19	5.54	3.81	0.64	4.23	0.68	3.35	6.60	4.76	5.55	2.92	3.40	1.79	11.46
73	11	8	11.91	2.49	4.71	22.00	4.17	5.46	3.78	0.80	4.23	0.77	3.36	6.52	4.59	5.42	2.91	3.40	1.74	11.72
73	11	9	11.86	2.64	4.80	21.92	4.13	5.70	3.93	0.66	4.35	0.81	3.42	6.75	4.58	5.52	3.00	3.48	1.60	11.07
73	11	10	11.84	2.53	4.76	21.78	4.16	5.42	3.84	0.80	4.34	0.81	3.39	6.68	4.63	5.37	2.99	3.51	1.70	11.43
73	11	16	11.82	2.39	4.76	21.92	3.98	6.28	3.77	0.89	3.80	0.68	3.26	6.74	4.64	5.18	2.96	3.67	1.41	11.87
73	11	17	11.79	2.56	4.79	22.01	4.01	6.08	3.90	0.74	4.09	0.84	3.42	6.70	4.60	4.92	2.89	3.66	1.63	11.36
73	11	18	11.67	2.50	4.76	21.76	3.96	6.15	3.80	0.84	4.18	0.85	3.33	6.70	4.45	5.39	3.12	3.61	1.70	11.23
73	11	19	11.66	2.38	4.67	21.66	3.99	6.28	3.75	0.96	3.84	0.89	3.28	6.62	4.59	5.27	2.95	3.70	1.71	11.76
73	11	20	11.73	2.39	4.74	21.68	4.00	6.17	3.82	0.94	3.88	0.68	3.28	6.68	4.60	5.17	2.85	3.57	1.78	12.05
73	11	21	11.69	2.59	4.88	21.37	4.21	5.45	3.90	0.72	4.32	0.73	3.42	6.73	4.72	5.06	2.90	3.41	1.58	11.46
73	11	22	11.87	2.54	4.74	22.05	4.08	5.65	3.91	0.74	4.04	0.89	3.44	6.72	4.46	4.92	2.80	3.63	1.65	11.87
73	11	23	11.69	2.56	4.82	21.53	4.06	5.98	3.85	0.79	4.24	0.79	3.33	6.68	4.66	5.28	2.98	3.54	1.85	11.37
73	11	24	11.75	2.56	4.90	21.77	4.02	6.22	3.86	0.70	4.09	0.79	3.35	6.65	4.60	5.27	2.98	3.57	1.65	11.27
73	11	25	11.79	2.44	4.82	21.62	4.01	6.52	3.85	0.87	3.79	0.73	3.26	6.76	4.60	5.18	2.91	3.69	1.72	11.43
73	11	26	11.69	2.63	4.82	21.80	4.09	5.62	3.88	0.80	4.39	0.84	3.39	6.67	4.63	5.16	2.92	3.47	1.70	11.51
73	31	1	11.72	2.56	4.65	22.03	4.11	5.68	3.81	0.77	4.26	1.21	4.09	6.59	4.37	5.03	2.68	3.19	1.80	11.45
73	31	2	11.76	2.51	4.63	21.94	4.16	5.65	3.83	0.58	4.26	0.95	3.78	6.85	4.31	5.10	2.64	3.22	1.96	11.37
73	31	3	11.80	2.47	4.53	22.02	4.16	5.76	3.78	0.71	4.22	1.08	3.94	7.01	4.27	5.10	2.67	3.17	1.63	11.67
73	31	4	11.90	2.52	4.96	22.28	4.20	5.69	3.81	0.71	4.19	1.04	3.47	6.55	4.42	5.12	2.74	3.23	1.52	11.74
73	31	5	11.78	2.55	4.59	22.21	4.13	5.71	3.81	0.67	4.29	1.04	3.55	6.69	4.39	4.93	2.63	3.19	2.18	11.67
73	31	6	11.95	2.57	4.76	22.22	4.23	5.72	3.96	0.70	4.34	0.71	3.61	6.60	4.36	5.05	2.72	3.35	1.60	11.58
73	31	7	11.83	2.53	4.88	22.21	4.20	5.77	3.81	0.74	4.16	1.17	3.42	6.40	4.57	5.07	2.70	3.18	1.85	11.51
73	31	8	11.72	2.53	4.74	21.98	4.14	5.80	3.81	0.70	4.26	0.95	3.76	6.83	4.27	5.08	2.65	3.18	1.92	11.68
73	31	9	11.78	2.57	4.66	22.05	4.19	5.99	3.89	0.70	4.29	0.92	3.56	6.67	4.41	4.89	2.70	3.33	1.93	11.48
73	31	10	11.78	2.53	4.59	22.13	4.15	5.85	3.79	0.68	4.36	1.07	3.91	6.68	4.18	4.92	2.63	3.20	1.90	11.64
73	31	16	11.72	2.42	4.82	22.02	4.12	6.09	3.84	0.97	3.77	1.03	3.37	6.55	4.14	4.85	2.68	3.55	1.75	12.31
73	31	17	11.42	2.57	4.83	21.85	4.02	6.28	3.73	0.84	3.97	1.06	3.97	6.62	4.15	4.90	2.85	3.57	1.84	11.52
73	31	18	11.68	2.55	4.89	22.21	4.07	6.06	3.78	0.93	4.05	0.88	3.39	6.61	4.39	4.93	2.84	3.35	1.43	11.96
73	31	19	11.69	2.41	4.81	22.01	4.10	6.34	3.78	1.01	3.74	0.80	3.55	6.64	4.41	4.85	2.62	3.60	1.67	12.16
73	31	20	11.79	2.40	4.83	22.40	4.11	6.36	3.73	0.99	3.73	0.77	3.37	6.57	4.33	4.87	2.63	3.51	1.35	12.25
73	31	21	11.70	2.56	4.89	22.16	4.23	5.39	3.75	0.88	4.21	1.35	3.89	6.57	4.51	4.89	2.77	3.20	1.46	11.60
73	31	22	11.79	2.54	4.84	22.32	4.20	5.99	3.80	0.85	4.06	0.80	3.46	6.58	4.09	4.93	2.80	3.47	1.50	11.98
73	31	23	11.68	2.50	4.92	22.19	4.07	6.14	3.74	0.96	3.99	0.88	3.42	6.62	4.59	4.80	2.65	3.40	1.37	12.05
73	31	24	11.66	2.61	5.02	22.02	4.13	6.25	3.80	0.94	4.10	0.81	3.42	6.55	4.22	4.88	2.89	3.45	1.65	11.60
73	31	25	11.78	2.55	4.92	22.41	4.18	6.04	3.76	0.95	4.15	0.79	3.45	6.63	4.23	4.91	2.67	3.29	1.40	11.88
73	31	26	11.79	2.67	4.93	22.33	4.22	5.54	3.84	0.92	4.38	0.86	3.48	6.60	4.36	4.96	2.75	3.25	1.59	11.51
73	31	31	11.86	2.48	4.79	22.36	4.17	5.71	3.82	0.91	3.95	0.71	3.38	6.59	4.39	5.12	2.74	3.32	1.59	12.07
73	41	1	11.82	2.50	4.84	22.14	4.22	5.54	3.78	0.86	4.08	0.84	3.58	6.70	4.59	5.25	2.71	3.29	1.61	11.66
73	41	2	11.95	2.49	4.86	22.21	4.23	5.66	3.82	0.73	4.14	0.74	3.43	6.57	4.57	5.25	2.80	3.27	1.44	11.84
73	41	3	12.02	2.51	4.81	22.25	4.23	5.55	3.88	0.68	4.15	0.89	3.46	6.60	4.54	5.19	2.75	3.23	1.51	11.76
73	41	4	12.05	2.50	4.86	22.16	4.24	5.44	3.87	0.79	4.17	0.78	3.44	6.59	4.35	5.11	2.75	3.31	1.52	11.86
73	41	5	11.95	2.51	4.91	22.22	4.32	5.71	3.86	0.80	4.10	0.68	3.45	6.58	4.58	5.08	2.61	3.24	1.48	11.95

TABLE 3. 1973-74 UPT % OF TOTAL (GRAMS AMINO ACID/100 GRAMS OF AMINO ACID) - MEAN OF TWO REPS

YR	L	V	ASP	THR	SER	GLU	PRO	GLY	ALA	CYS	VAL	MET	ILE	LEU	TYR	PHE	HIS	LYS	NH4	ARG
73	41	6	12.03	2.53	4.83	22.27	4.26	5.47	3.86	0.67	4.17	0.73	3.46	6.64	4.48	5.18	2.76	3.33	1.46	11.87
73	41	7	12.05	2.51	4.83	22.33	4.25	5.53	3.85	0.67	4.15	0.73	3.50	6.65	4.42	5.22	2.78	3.23	1.42	11.88
73	41	8	11.97	2.45	4.76	22.21	4.23	5.47	3.80	0.70	4.12	0.83	3.72	6.79	4.62	5.17	2.70	3.12	1.43	11.89
73	41	9	11.87	2.58	5.04	22.04	4.13	5.80	3.86	0.80	4.19	0.85	3.42	6.60	4.55	5.07	2.94	3.27	1.44	11.79
73	41	10	12.06	2.54	4.81	22.51	4.19	5.42	3.85	0.77	4.22	0.84	3.53	6.71	4.23	5.13	2.77	3.25	1.40	11.76
73	41	16	11.94	2.40	4.85	22.27	4.25	6.19	3.80	0.95	3.73	0.69	3.40	6.58	4.30	4.98	2.56	3.42	1.44	12.26
73	41	17	11.82	2.52	4.83	22.18	4.22	6.01	3.79	0.90	3.95	1.00	3.40	6.40	4.42	4.95	2.78	3.45	1.33	12.02
73	41	18	11.82	2.54	4.81	22.10	4.22	5.86	3.84	0.82	4.02	0.79	3.46	6.56	4.26	5.06	2.73	3.37	1.50	12.21
73	41	19	11.71	2.36	4.79	21.94	4.16	6.17	3.70	0.95	3.63	1.11	3.68	6.30	4.24	4.73	2.67	3.61	1.64	12.31
73	41	20	11.87	2.42	4.75	22.24	4.18	6.07	3.81	0.92	3.76	0.78	3.44	6.56	4.35	4.84	2.52	3.47	1.54	12.45
73	41	21	11.93	2.55	4.78	21.97	4.30	5.32	3.81	0.85	4.19	0.98	3.98	6.64	4.57	4.93	2.66	3.22	1.35	11.77
73	41	22	11.79	2.56	4.72	22.04	4.23	5.83	3.80	0.89	4.02	0.95	3.66	6.62	4.36	5.12	2.73	3.44	1.34	11.86
73	41	23	11.88	2.56	4.87	22.11	4.26	5.87	3.84	0.85	4.08	0.72	3.45	6.61	4.35	4.94	2.69	3.46	1.56	11.89
73	41	24	11.91	2.50	4.69	22.21	4.20	5.86	3.82	0.83	4.04	0.75	3.43	6.56	4.45	5.15	2.72	3.36	1.39	12.13
73	41	25	11.97	2.46	4.83	22.06	4.24	6.01	3.84	0.83	3.85	0.80	3.41	6.59	4.50	4.86	2.64	3.41	1.44	12.27
73	41	26	11.83	2.64	4.85	22.19	4.23	5.37	3.82	0.91	4.31	0.88	3.43	6.59	4.47	4.97	2.77	3.37	1.38	11.99
73	41	31	11.74	2.47	4.71	21.97	4.17	5.65	3.78	0.86	3.91	0.96	3.75	6.70	4.54	4.98	2.74	3.43	1.63	12.01
73	51	1	11.74	2.55	4.87	21.68	4.16	5.78	3.98	0.81	4.25	0.84	3.49	6.62	4.34	5.31	2.85	3.33	2.08	11.54
73	51	2	12.01	2.52	4.89	22.10	4.15	5.60	3.98	0.64	4.19	0.77	3.47	6.68	4.33	5.30	2.91	3.35	1.45	11.67
73	51	3	12.11	2.54	4.93	22.32	4.35	5.64	3.92	0.63	4.17	0.71	3.43	6.43	4.51	5.04	2.76	3.34	1.51	11.65
73	51	4	11.85	2.49	4.85	21.72	4.20	5.57	3.96	0.62	4.15	0.89	3.80	6.81	4.55	5.21	2.79	3.27	1.78	11.47
73	51	5	11.83	2.53	4.83	21.86	4.12	5.63	3.92	0.55	4.22	0.83	3.52	6.66	4.60	5.23	2.84	3.40	1.80	11.61
73	51	6	11.81	2.55	4.87	21.72	4.20	5.63	4.03	0.70	4.23	1.08	3.44	6.58	4.64	5.14	2.80	3.26	1.81	11.52
73	51	7	11.99	2.54	4.93	22.39	4.17	5.62	3.84	0.59	4.15	0.77	3.40	6.46	4.49	5.28	2.93	3.41	1.45	11.57
73	51	8	11.81	2.50	4.85	22.06	4.16	5.75	3.91	0.66	4.23	0.89	3.50	6.54	4.59	5.32	2.92	3.38	1.29	11.64
73	51	9	11.81	2.60	4.79	22.02	4.12	5.69	3.94	0.65	4.23	0.92	3.39	6.44	4.66	5.00	2.84	3.35	1.98	11.37
73	51	10	11.76	2.57	4.86	21.82	4.06	5.58	3.93	0.72	4.22	1.00	3.76	6.66	4.51	5.17	2.87	3.35	1.36	11.79
73	51	16	11.74	2.36	4.76	21.92	3.95	6.41	3.77	0.77	3.73	0.79	3.35	6.47	4.49	5.09	2.77	3.56	1.81	12.26
73	51	17	11.77	2.55	4.78	22.07	4.13	6.12	3.90	0.72	4.07	0.73	3.37	6.67	4.43	5.04	2.80	3.44	1.87	11.54
73	51	18	11.80	2.47	4.78	22.08	4.16	5.66	3.87	0.86	4.08	0.98	3.34	6.67	4.45	4.86	2.83	3.27	2.13	11.70
73	51	19	11.70	2.34	4.72	21.75	4.00	6.42	3.77	0.57	3.71	0.90	3.82	6.75	4.41	5.12	2.64	3.50	1.91	11.96
73	51	20	11.77	2.41	4.79	21.76	4.17	6.38	3.89	0.67	3.80	0.81	3.37	6.70	4.17	4.88	2.76	3.58	2.23	11.86
73	51	21	11.97	2.59	4.91	22.16	4.29	5.54	3.88	0.68	4.33	0.73	3.53	6.65	4.51	5.18	2.93	3.19	1.72	11.36
73	51	22	11.78	2.54	4.72	22.00	4.14	5.93	3.87	0.75	4.05	0.75	3.58	6.65	4.52	5.04	2.87	3.52	1.82	11.66
73	51	23	11.79	2.51	4.90	21.88	4.26	6.08	3.87	0.68	4.10	0.92	3.43	6.68	4.51	4.85	2.88	3.51	2.11	11.27
73	51	24	11.69	2.51	4.78	21.84	4.19	6.24	3.90	0.67	4.06	0.76	3.40	6.69	4.49	4.98	2.83	3.48	2.18	11.42
73	51	25	11.83	2.39	4.77	21.94	4.16	6.40	3.81	0.80	3.74	0.69	3.35	6.72	4.59	4.86	2.63	3.40	2.05	11.86
73	51	26	11.79	2.65	4.86	22.12	4.23	5.62	3.85	0.66	4.35	0.79	3.39	6.62	4.60	5.02	2.87	3.31	2.03	11.25
73	51	31	11.81	2.49	4.78	22.13	4.02	6.00	3.84	0.68	4.01	0.77	3.36	6.56	4.56	5.36	2.81	3.41	1.89	11.63
73	52	1	11.92	2.55	4.90	22.49	4.25	5.60	3.75	0.87	4.07	0.82	3.42	6.47	4.54	5.32	2.65	3.37	1.27	11.92
73	52	2	11.81	2.51	4.84	22.08	4.23	5.95	3.84	0.70	4.18	0.74	3.46	6.49	4.45	5.18	2.74	3.32	1.78	11.69
73	52	3	11.96	2.52	4.92	22.39	4.28	5.60	3.78	0.79	4.07	0.99	3.57	6.49	4.38	5.10	2.70	3.28	1.29	11.89
73	52	4	11.85	2.53	4.89	22.17	4.26	5.74	3.80	0.84	4.15	0.72	3.49	6.64	4.39	5.12	2.60	3.29	1.51	12.02
73	52	5	11.85	2.54	4.84	22.25	4.25	5.80	3.80	0.84	4.15	0.70	3.48	6.58	4.39	5.14	2.70	3.33	1.49	11.85
73	52	6	11.97	2.57	4.94	22.31	4.34	5.57	3.85	0.85	4.13	0.91	3.45	6.46	4.42	5.10	2.64	3.26	1.51	11.81
73	52	7	11.90	2.55	4.90	22.21	4.30	5.82	3.84	0.82	4.17	0.85	3.63	6.47	4.21	5.08	2.63	3.29	1.56	11.75
73	52	8	11.84	2.51	4.88	22.18	4.23	5.76	3.75	0.89	4.02	0.88	3.62	6.50	4.42	5.09	2.71	3.40	1.39	11.93
73	52	9	11.91	2.58	4.93	22.17	4.21	6.01	3.84	0.85	4.13	0.85	3.43	6.63	4.31	5.01	2.66	3.28	1.50	11.72

TABLE 3. 1973-74 UPT % OF TOTAL (GRAMS AMINO ACID/100 GRAMS OF AMINO ACID) - MEAN OF TWO REPS

YR	L	V	ASP	THR	SER	GLU	PRO	GLY	ALA	CYS	VAL	MET	ILE	LEU	TYR	PHE	HIS	LYS	NH4	ARG
73	52	10	11.95	2.56	4.89	22.33	4.25	5.60	3.75	0.86	4.15	0.95	3.44	6.56	4.39	4.96	2.60	3.36	1.40	11.99
73	52	16	11.86	2.39	4.80	22.35	4.12	6.23	3.70	0.96	3.72	0.94	3.36	6.53	4.45	4.88	2.61	3.51	1.38	12.22
73	52	17	11.69	2.49	4.73	22.38	3.93	6.03	3.73	0.84	3.96	0.91	3.33	6.49	4.15	5.10	2.82	3.48	1.88	12.04
73	52	18	11.66	2.53	4.86	22.10	4.15	6.16	3.80	0.84	4.01	0.96	3.45	6.61	4.23	5.01	2.86	3.35	1.60	11.81
73	52	19	11.81	2.37	4.86	22.39	4.07	6.34	3.68	0.99	3.66	0.96	3.32	6.45	4.32	4.85	2.65	3.51	1.24	12.53
73	52	20	11.67	2.40	4.90	22.00	4.12	6.57	3.77	1.02	3.72	0.92	3.34	6.51	4.33	4.77	2.64	3.50	1.62	12.22
73	52	21	11.86	2.56	4.80	22.29	4.06	5.49	3.80	0.76	4.26	0.85	3.38	6.46	4.46	5.22	2.86	3.35	1.93	11.61
73	52	22	11.71	2.55	4.83	22.02	4.14	6.04	3.85	0.90	4.05	0.80	3.42	6.56	4.51	5.00	2.78	3.41	1.69	11.73
73	52	23	11.67	2.56	4.95	21.92	4.23	6.13	3.81	0.88	4.13	0.84	3.54	6.67	4.45	4.97	2.77	3.43	1.51	11.54
73	52	24	11.79	2.55	4.81	22.11	4.02	6.25	3.79	0.71	3.99	0.81	3.35	6.46	4.46	5.08	2.79	3.51	1.91	11.60
73	52	25	11.78	2.44	4.82	22.11	4.11	6.39	3.75	0.94	3.76	0.80	3.34	6.61	4.32	4.89	2.64	3.64	1.39	12.27
73	52	26	11.78	2.67	4.99	22.20	4.20	5.66	3.84	0.88	4.34	0.86	3.40	6.46	4.27	5.05	2.92	3.37	1.64	11.47
73	52	31	11.77	2.48	4.75	22.29	4.18	6.01	3.81	0.88	3.98	0.80	3.42	6.55	4.37	5.03	2.68	3.36	1.44	12.20
73	61	1	12.04	2.48	4.90	22.08	4.21	5.49	3.83	0.80	4.12	0.80	3.36	6.63	4.54	5.20	2.74	3.32	1.73	11.69
73	61	2	12.14	2.51	4.90	22.23	4.14	5.57	3.89	0.71	4.13	0.74	3.39	6.76	4.69	5.05	2.84	3.46	1.62	11.23
73	61	3	12.01	2.49	4.85	21.85	4.22	5.57	3.87	0.69	4.09	0.69	3.42	6.70	4.65	5.00	2.80	3.55	1.77	11.79
73	61	4	12.00	2.48	4.86	21.93	4.17	5.56	3.85	0.74	4.09	0.73	3.41	6.72	4.75	5.04	2.77	3.48	1.73	11.69
73	61	5	12.05	2.52	4.90	22.14	4.14	5.70	3.88	0.62	4.12	0.67	3.43	6.69	4.65	5.06	2.90	3.53	1.45	11.54
73	61	6	11.99	2.56	4.96	21.81	4.16	5.58	3.92	0.70	4.12	0.72	3.42	6.68	4.63	5.03	2.92	3.55	1.68	11.56
73	61	7	12.04	2.50	4.84	22.03	4.16	5.54	3.86	0.75	4.09	0.73	3.41	6.76	4.65	5.08	2.80	3.46	1.60	11.68
73	61	8	12.03	2.46	4.84	21.99	4.19	5.61	3.91	0.84	4.30	0.59	3.38	6.69	4.59	5.06	2.84	3.43	1.65	11.61
73	61	9	11.94	2.57	5.02	21.89	4.10	5.90	3.91	0.77	4.17	0.86	3.38	6.76	4.72	5.02	2.93	3.41	1.66	10.98
73	61	10	11.99	2.61	5.11	21.78	4.10	5.60	3.93	0.73	4.21	0.85	3.41	6.68	4.72	4.99	2.92	3.38	1.78	11.20
73	61	16	11.87	2.35	4.66	22.05	3.99	6.53	3.81	0.75	3.89	0.68	3.42	6.63	4.43	4.80	2.92	3.90	1.62	11.69
73	61	17	11.85	2.50	4.66	22.24	3.95	6.21	3.85	0.74	4.18	0.69	3.40	6.76	4.60	5.02	2.88	3.46	1.54	11.45
73	61	18	11.88	2.49	4.65	22.03	4.00	6.18	3.89	0.54	4.20	0.88	3.49	6.74	4.62	5.07	3.01	3.75	1.55	11.03
73	61	19	11.90	2.33	4.58	21.98	4.06	6.49	3.80	0.60	3.85	0.74	3.46	6.71	4.46	4.94	2.84	3.79	1.72	11.76
73	61	20	11.76	2.29	4.59	21.93	4.02	6.33	3.75	0.83	3.84	0.79	3.36	6.71	4.49	4.97	2.86	3.76	1.71	12.01
73	61	21	12.08	2.55	4.96	22.33	4.17	5.59	3.95	0.67	4.38	0.63	3.39	6.71	4.56	5.21	2.94	3.21	1.47	11.18
73	61	22	11.86	2.50	4.55	21.92	4.16	5.93	3.93	0.67	4.19	0.69	3.42	6.73	4.52	5.05	2.73	3.51	1.92	11.68
73	61	23	11.91	2.48	4.74	21.99	4.08	6.06	3.85	0.60	4.29	0.77	3.47	6.74	4.63	4.92	2.81	3.45	1.56	11.64
73	61	24	11.83	2.48	4.63	21.85	4.09	6.37	3.85	0.68	4.19	0.68	3.42	6.73	4.44	5.16	2.77	3.46	1.76	11.62
73	61	25	11.81	2.39	4.66	21.74	4.01	6.76	3.80	0.77	3.87	0.70	3.36	6.75	4.44	4.92	2.71	3.60	1.96	11.76
73	61	26	11.90	2.58	4.72	22.05	4.13	5.60	3.89	0.68	4.48	0.72	3.46	6.75	4.67	5.11	2.82	3.35	1.78	11.32
73	64	1	11.97	2.47	4.84	22.07	4.19	5.49	3.79	0.87	4.12	0.85	3.34	6.60	4.59	5.20	2.85	3.32	1.51	11.92
73	64	2	11.91	2.48	4.81	21.93	4.21	5.57	3.81	0.83	4.14	0.84	3.37	6.65	4.69	5.22	2.85	3.31	1.56	11.82
73	64	3	11.83	2.47	4.77	21.72	4.13	5.38	3.78	0.79	4.07	0.71	3.39	6.59	4.64	5.11	2.82	3.32	1.68	12.79
73	64	4	11.81	2.45	4.79	21.92	4.17	5.45	3.82	0.79	4.05	0.78	3.36	6.68	4.54	5.22	2.78	3.32	2.09	11.98
73	64	5	11.96	2.50	4.87	21.96	4.23	5.46	3.81	0.79	4.08	0.81	3.36	6.63	4.69	5.11	2.83	3.29	1.55	12.07
73	64	6	11.82	2.51	4.82	21.92	4.11	5.41	3.87	0.80	4.09	0.78	3.38	6.65	4.45	5.37	2.88	3.42	2.07	11.65
73	64	7	11.73	2.44	4.73	22.07	4.07	5.43	3.76	0.76	3.99	0.85	3.42	6.73	4.59	5.28	2.69	3.24	2.32	11.90
73	64	8	11.82	2.47	4.80	21.93	4.17	5.50	3.76	0.78	4.03	0.79	3.38	6.63	4.42	5.24	2.83	3.29	2.02	12.15
73	64	9	11.86	2.57	4.81	21.69	4.17	5.70	3.95	0.79	4.07	0.86	3.42	6.72	4.59	4.98	2.78	3.42	1.91	11.70
73	64	10	11.79	2.52	4.80	22.17	4.13	5.53	3.88	0.82	4.12	0.86	3.42	6.55	4.50	5.12	2.76	3.30	1.91	11.82
73	64	16	11.72	2.33	4.74	21.89	4.06	6.18	3.71	0.80	3.67	1.09	3.73	6.77	4.57	5.01	2.77	3.43	1.60	11.92
73	64	17	11.77	2.47	4.60	21.77	4.13	5.74	3.86	0.72	4.09	0.65	3.35	6.61	4.71	5.27	3.00	3.54	1.84	11.90
73	64	18	11.64	2.45	4.64	21.49	4.06	5.86	3.84	0.93	4.07	0.83	3.42	6.68	4.60	5.06	2.87	3.39	2.12	12.01
73	64	19	11.77	2.37	4.76	21.82	4.04	6.09	3.75	0.83	3.68	1.04	3.76	6.81	4.56	5.04	2.78	3.50	1.42	12.01

TABLE 3. 1973-74 UPT % OF TOTAL (GRAMS AMINO ACID/100 GRAMS OF AMINO ACID) - MEAN OF TWO REPS

YR	L	V	ASP	THR	SER	GLU	PRO	GLY	ALA	CYS	VAL	MET	ILE	LEU	TYR	PHE	HIS	LYS	NH4	ARG
73	64	20	11.72	2.31	4.69	21.87	4.08	6.06	3.73	0.91	3.64	1.07	3.20	6.55	4.58	4.98	2.88	3.68	1.71	12.34
73	64	21	11.89	2.50	4.72	22.06	4.25	5.42	3.81	0.67	4.37	0.70	3.36	6.62	4.76	5.49	2.93	3.24	1.73	11.47
73	64	22	11.81	2.46	4.66	21.87	4.12	5.68	3.81	0.79	4.09	0.83	3.35	6.61	4.51	5.35	2.93	3.42	1.76	11.95
73	64	23	11.87	2.46	4.86	21.88	4.22	5.82	3.83	0.79	4.02	0.81	3.30	6.59	4.71	5.27	2.85	3.36	1.62	11.72
73	64	24	11.79	2.46	4.76	21.88	4.09	6.11	3.78	0.79	4.08	0.76	3.31	6.66	4.47	5.32	2.97	3.46	1.61	11.69
73	64	25	11.83	2.38	4.74	21.79	4.14	6.14	3.82	0.87	3.79	0.69	3.29	6.66	4.66	5.25	2.81	3.54	1.64	11.95
73	64	26	11.76	2.59	4.77	21.97	4.15	5.44	3.86	0.80	4.36	0.81	3.35	6.56	4.77	5.33	2.91	3.36	1.85	11.35
73	71	1	12.08	2.53	4.87	21.95	4.19	5.60	3.91	0.71	4.21	0.69	3.48	6.67	4.64	5.25	2.80	3.37	1.41	11.68
73	71	2	12.05	2.50	4.71	21.85	4.19	5.71	3.90	0.52	4.33	0.74	3.50	6.76	4.56	5.05	2.74	3.45	1.82	11.61
73	71	3	12.03	2.50	4.75	21.91	4.17	5.71	3.91	0.69	4.30	0.76	3.49	6.62	4.54	5.22	2.77	3.45	1.77	11.42
73	71	4	11.99	2.46	4.56	21.82	4.22	5.64	3.87	0.64	4.37	0.69	3.49	6.73	4.51	5.26	2.70	3.47	1.81	11.74
73	71	5	12.09	2.53	4.85	21.95	4.10	5.74	3.91	0.69	4.23	0.66	3.43	6.68	4.65	5.27	2.82	3.39	1.37	11.62
73	71	6	11.98	2.53	4.69	21.64	4.24	5.88	3.92	0.59	4.36	0.75	3.48	6.64	4.54	5.26	2.73	3.52	1.74	11.52
73	71	7	12.05	2.49	4.66	21.82	4.15	5.61	3.90	0.64	4.29	0.73	3.47	6.75	4.60	5.18	2.73	3.40	1.72	11.81
73	71	8	12.20	2.53	4.76	21.49	4.22	5.78	3.94	0.59	4.35	0.69	3.48	6.79	4.61	5.29	2.80	3.37	1.46	11.65
73	71	9	11.90	2.56	4.71	21.77	4.05	5.89	3.95	0.69	4.27	0.77	3.51	6.69	4.54	5.09	2.97	3.67	1.54	11.40
73	71	10	11.95	2.54	4.74	21.86	4.13	5.64	3.97	0.66	4.30	0.89	3.54	6.70	4.64	5.06	2.95	3.64	1.39	11.38
73	71	25	11.93	2.47	4.65	21.66	4.08	6.21	3.96	0.62	3.96	0.61	3.50	6.71	4.63	5.01	2.93	3.80	1.47	11.89
73	72	1	12.12	2.51	4.86	22.10	4.13	5.53	3.92	0.75	4.19	0.73	3.42	6.67	4.54	5.26	2.79	3.36	1.29	11.82
73	72	2	11.98	2.49	4.68	21.83	4.12	5.80	3.88	0.66	4.36	0.76	3.52	6.73	4.64	5.29	2.76	3.37	1.74	11.35
73	72	3	12.10	2.48	4.63	21.94	4.20	5.58	3.94	0.48	4.35	0.72	3.55	6.76	4.57	5.20	2.74	3.41	1.76	11.58
73	72	4	12.05	2.50	4.69	21.84	4.25	5.64	3.94	0.63	4.31	0.68	3.50	6.68	4.44	5.27	2.76	3.44	1.72	11.65
73	72	5	12.07	2.51	4.67	21.73	4.24	5.60	3.92	0.67	4.33	0.69	3.49	6.73	4.60	5.33	2.67	3.35	1.73	11.67
73	72	6	12.08	2.48	4.61	21.86	4.17	5.49	3.92	0.66	4.35	0.77	3.50	6.73	4.57	5.20	2.66	3.38	1.73	11.83
73	72	7	12.07	2.49	4.69	21.89	4.13	5.63	3.90	0.65	4.30	0.72	3.54	6.74	4.66	5.23	2.77	3.35	1.63	11.63
73	72	8	12.13	2.49	4.73	22.06	4.13	5.62	3.93	0.69	4.30	0.68	3.51	6.77	4.51	5.36	2.76	3.32	1.52	11.48
73	72	9	11.88	2.61	4.75	21.74	4.06	5.99	4.00	0.67	4.30	0.83	3.54	6.69	4.57	5.00	3.01	3.71	1.44	11.20
73	72	10	11.97	2.55	4.74	21.93	4.12	5.55	3.93	0.73	4.34	0.78	3.52	6.67	4.69	4.95	2.92	3.56	1.52	11.52
73	72	25	11.90	2.44	4.68	21.73	4.09	6.11	3.95	0.71	4.01	0.64	3.49	6.73	4.57	4.96	2.90	3.69	1.55	11.84
74	11	2	12.03	2.58	4.81	22.21	4.27	5.69	3.82	0.65	4.25	0.89	3.41	6.70	4.49	5.09	2.71	3.42	1.45	11.54
74	11	3	12.21	2.60	4.84	22.11	4.33	5.64	3.90	0.61	4.21	0.72	3.42	6.70	4.57	5.00	2.72	3.35	1.42	11.64
74	11	4	12.08	2.63	5.24	21.76	4.31	5.77	3.89	0.63	4.16	0.70	3.32	6.59	4.54	5.10	3.01	3.39	1.48	11.40
74	11	5	12.11	2.58	4.98	22.14	4.30	5.80	3.81	0.63	4.21	0.82	3.34	6.72	4.50	5.12	2.77	3.40	1.44	11.35
74	11	6	12.16	2.62	4.93	22.32	4.24	5.80	3.85	0.63	4.24	0.78	3.45	6.65	4.48	5.00	2.67	3.35	1.46	11.36
74	11	7	12.10	2.61	4.90	22.28	4.26	5.79	3.84	0.72	4.20	0.89	3.44	6.69	4.47	5.00	2.64	3.36	1.41	11.39
74	11	9	12.25	2.62	4.74	22.30	4.30	5.93	3.95	0.64	4.26	0.82	3.49	6.79	4.44	4.69	2.61	3.43	1.45	11.29
74	11	11	12.14	2.58	4.90	22.18	4.31	5.50	3.87	0.65	4.21	0.77	3.39	6.85	4.44	5.12	2.76	3.37	1.44	11.51
74	11	12	12.22	2.60	4.70	22.11	4.41	5.67	3.95	0.53	4.35	0.76	3.46	6.74	4.57	4.80	2.66	3.43	1.49	11.52
74	11	13	11.89	2.63	4.71	22.03	4.30	5.73	3.96	0.55	4.39	0.99	3.74	6.74	4.53	4.86	2.87	3.35	1.48	11.25
74	11	14	12.18	2.61	4.80	22.10	4.33	5.66	3.90	0.71	4.26	0.80	3.51	6.71	4.48	5.01	2.64	3.23	1.63	11.44
74	11	15	12.15	2.56	4.74	22.30	4.42	5.73	3.89	0.63	4.31	0.82	3.48	6.84	4.54	4.91	2.71	3.32	1.46	11.17
74	11	19	12.24	2.46	4.71	22.44	4.37	6.09	3.92	0.58	3.94	0.71	3.45	6.73	4.34	4.44	2.53	3.49	1.78	11.77
74	11	20	12.31	2.46	4.63	22.30	4.40	5.91	4.00	0.63	3.99	0.66	3.39	6.73	4.39	4.65	2.50	3.44	1.54	12.05
74	11	21	12.21	2.58	4.78	22.28	4.56	5.36	3.90	0.58	4.45	0.84	3.47	6.71	4.60	4.92	2.67	3.24	1.49	11.35
74	11	22	11.95	2.51	4.53	22.00	4.30	5.56	3.97	0.55	4.15	0.68	3.41	6.72	4.49	5.25	2.83	3.60	1.84	11.65
74	11	23	12.22	2.56	4.85	22.42	4.51	6.09	3.93	0.63	4.22	0.81	3.47	6.69	4.45	4.59	2.53	3.27	1.45	11.32
74	11	24	11.66	2.50	4.48	21.84	4.16	5.76	3.90	0.55	4.08	0.78	3.32	6.66	4.53	6.16	2.98	3.71	1.77	11.16
74	11	25	12.18	2.49	4.67	22.10	4.42	6.27	3.96	0.54	3.99	0.70	3.47	6.76	4.47	4.83	2.59	3.52	1.46	11.59

TABLE 3. 1973-74 UPT % OF TOTAL (GRAMS AMINO ACID/100 GRAMS OF AMINO ACID) - MEAN OF TWO REPS

YR	L	V	ASP	THR	SER	GLU	PRO	GLY	ALA	CYS	VAL	MET	ILE	LEU	TYR	PHE	HIS	LYS	NH4	ARG
74	11	26	11.79	2.60	4.62	22.12	4.30	5.42	4.00	0.58	4.43	0.78	3.48	6.67	4.56	5.33	2.72	3.55	1.83	11.21
74	11	27	11.92	2.36	4.50	22.32	4.22	5.77	3.90	0.70	3.83	0.74	3.32	6.70	4.42	5.20	2.55	3.56	1.78	12.22
74	11	28	12.35	2.58	4.69	22.33	4.49	5.69	4.02	0.51	4.25	0.78	3.54	6.81	4.45	4.39	2.56	3.44	1.48	11.64
74	11	29	12.25	2.60	4.72	22.26	4.50	5.95	3.98	0.63	4.25	0.79	3.52	6.74	4.47	4.64	2.54	3.36	1.45	11.32
74	11	30	12.51	2.43	4.53	22.52	4.42	5.70	4.03	0.58	3.98	0.61	3.42	6.76	4.52	5.07	2.64	3.74	1.89	10.65
74	11	31	12.43	2.51	4.66	22.18	4.37	5.81	3.94	0.55	4.16	0.72	3.32	6.74	4.47	5.04	2.67	3.35	1.49	11.57
74	21	2	12.09	2.51	4.81	21.87	4.34	5.45	3.82	0.79	4.21	0.71	3.42	6.58	4.59	5.30	2.69	3.36	1.91	11.56
74	21	3	12.07	2.54	4.81	21.80	4.34	5.48	3.88	0.79	4.22	0.73	3.36	6.57	4.56	5.30	2.68	3.39	1.82	11.64
74	21	4	12.06	2.53	4.86	21.78	4.34	5.46	3.86	0.85	4.22	0.76	3.38	6.54	4.58	5.30	2.70	3.33	1.89	11.56
74	21	5	11.90	2.53	4.81	21.76	4.33	5.62	3.81	0.75	4.23	0.95	3.42	6.51	4.59	5.35	2.71	3.39	1.91	11.43
74	21	6	12.14	2.52	4.81	21.83	4.38	5.39	3.90	0.75	4.23	0.69	3.44	6.54	4.60	5.23	2.66	3.35	1.90	11.65
74	21	7	12.08	2.50	4.82	21.96	4.39	5.36	3.86	0.72	4.18	0.80	3.39	6.55	4.62	5.27	2.63	3.32	1.89	11.66
74	21	9	12.02	2.54	4.81	21.66	4.36	5.66	3.87	0.76	4.12	0.81	3.42	6.61	4.61	5.10	2.67	3.42	1.97	11.60
74	21	11	12.15	2.50	4.74	21.96	4.34	5.29	3.84	0.77	4.28	0.76	3.46	6.61	4.62	5.32	2.68	3.34	1.77	11.56
74	21	12	12.01	2.53	4.84	21.81	4.40	5.58	3.86	0.78	4.20	0.69	3.45	6.61	4.64	5.11	2.65	3.35	1.94	11.56
74	21	13	11.88	2.62	4.91	21.75	4.38	5.51	3.88	0.77	4.34	0.73	3.40	6.57	4.63	5.18	2.78	3.36	1.91	11.41
74	21	14	12.03	2.53	4.84	21.77	4.37	5.50	3.85	0.81	4.24	0.81	3.41	6.55	4.62	5.24	2.65	3.29	1.88	11.60
74	21	15	12.04	2.52	4.88	21.97	4.43	5.50	3.86	0.77	4.20	0.72	3.41	6.59	4.62	5.18	2.67	3.33	1.89	11.52
74	21	19	11.89	2.43	4.77	21.73	4.30	5.95	3.95	0.82	3.86	0.60	3.38	6.66	4.56	5.06	2.63	3.54	1.88	11.97
74	21	20	11.90	2.43	4.82	21.74	4.28	5.76	3.95	0.84	3.91	0.79	3.38	6.62	4.56	5.01	2.68	3.55	1.91	11.85
74	21	21	11.96	2.56	4.81	21.71	4.48	5.33	3.99	0.71	4.42	0.80	3.45	6.64	4.69	5.16	2.75	3.29	1.91	11.33
74	21	22	11.77	2.59	4.79	21.74	4.24	5.71	4.12	0.59	4.15	0.77	3.44	6.75	4.52	4.96	2.99	3.56	1.49	11.83
74	21	23	11.90	2.54	4.80	21.53	4.46	5.90	3.96	0.77	4.23	0.81	3.46	6.66	4.63	5.04	2.68	3.51	1.90	11.21
74	21	24	11.82	2.59	4.75	21.68	4.21	5.96	4.12	0.70	4.14	0.75	3.36	6.72	4.56	5.05	2.92	3.41	1.55	11.51
74	21	25	11.80	2.45	4.72	21.47	4.35	6.27	4.00	0.78	3.95	0.83	3.38	6.61	4.55	4.96	2.63	3.53	1.90	11.80
74	21	26	11.70	2.58	4.55	21.73	4.46	5.16	3.83	0.66	4.59	0.96	3.49	6.75	4.47	5.35	2.80	3.45	1.69	11.77
74	21	27	11.99	2.42	4.67	22.14	4.22	5.75	4.05	0.71	3.88	0.73	3.30	6.79	4.49	4.97	2.75	3.50	1.32	12.32
74	21	28	11.81	2.54	4.85	21.61	4.40	5.57	3.99	0.67	4.18	0.72	3.41	6.66	4.53	5.06	2.75	3.48	1.98	11.78
74	21	29	11.88	2.51	4.73	21.71	4.50	5.66	3.99	0.70	4.15	0.76	3.42	6.65	4.57	5.04	2.75	3.46	1.87	11.64
74	21	30	12.01	2.44	4.69	21.77	4.23	5.75	4.00	0.72	3.89	0.79	3.36	6.70	4.47	4.88	2.87	3.57	1.48	12.36
74	21	31	11.94	2.49	4.76	21.61	4.46	5.71	3.90	0.80	4.08	0.76	3.39	6.64	4.61	5.20	2.71	3.39	1.90	11.64
74	31	2	11.85	2.55	4.84	21.88	4.20	5.81	3.86	0.78	4.19	0.79	3.49	6.65	4.58	4.90	2.80	3.60	1.73	11.50
74	31	3	11.89	2.52	4.90	21.95	4.21	5.73	3.88	0.70	4.14	0.73	3.47	6.67	4.54	5.00	2.81	3.48	1.91	11.47
74	31	4	11.82	2.54	4.82	21.80	4.15	5.78	3.86	0.75	4.21	1.02	3.39	6.73	4.58	5.05	2.76	3.52	1.74	11.46
74	31	5	11.80	2.53	4.86	21.75	4.12	5.76	3.85	0.79	4.18	0.77	3.45	6.63	4.59	5.14	2.92	3.58	1.84	11.45
74	31	6	11.80	2.55	4.81	21.70	4.18	5.71	3.84	0.98	4.21	0.74	3.42	6.52	4.47	5.19	2.78	3.50	2.21	11.38
74	31	7	11.86	2.53	4.85	21.88	4.14	5.77	3.88	0.68	4.16	0.76	3.43	6.69	4.60	5.04	2.88	3.56	1.83	11.44
74	31	9	11.74	2.49	4.79	21.69	4.01	6.29	3.82	1.11	4.05	0.85	3.41	6.69	4.58	4.95	2.83	3.50	1.91	11.29
74	31	11	11.90	2.49	4.84	22.11	4.23	5.44	3.86	0.81	4.10	0.67	3.42	6.67	4.58	4.91	2.84	3.55	1.82	11.74
74	31	12	11.73	2.52	4.89	21.84	4.09	5.95	3.83	0.84	4.22	0.82	3.41	6.72	4.67	5.03	2.86	3.43	1.77	11.37
74	31	13	11.74	2.59	4.89	21.96	4.06	5.78	3.86	0.77	4.40	0.78	3.40	6.68	4.61	5.09	2.91	3.35	1.89	11.24
74	31	14	11.76	2.57	4.96	21.80	4.13	5.88	3.86	0.69	4.19	0.71	3.43	6.53	4.50	5.11	2.88	3.58	1.86	11.56
74	31	15	11.78	2.58	4.89	21.97	4.15	6.03	3.86	1.04	4.27	0.77	3.47	6.65	4.47	4.87	2.82	3.54	1.76	11.08
74	31	19	11.80	2.40	4.76	21.95	4.00	6.48	3.79	0.87	3.79	0.72	3.37	6.66	4.49	4.89	2.71	3.72	1.73	11.87
74	31	20	11.64	2.33	4.76	21.72	4.08	6.68	3.74	0.86	3.73	0.70	3.36	6.67	4.53	4.83	2.89	3.78	1.81	11.90
74	31	21	11.78	2.61	4.88	21.83	4.15	5.71	3.86	0.76	4.39	0.80	3.41	6.69	4.73	5.25	2.94	3.31	1.76	11.16
74	31	22	11.76	2.53	4.77	22.21	3.98	6.18	3.81	0.78	4.10	0.74	3.35	6.67	4.55	5.12	2.81	3.59	1.76	11.51
74	31	23	11.66	2.56	4.87	21.56	4.00	6.44	3.80	0.72	4.23	0.80	3.41	6.72	4.70	4.93	2.90	3.68	1.78	11.26

TABLE 3. 1973-74 UPT % OF TOTAL (GRAMS AMINO ACID/100 GRAMS OF AMINO ACID) - MEAN OF TWO REPS

YR	L	V	ASP	THR	SER	GLU	PRO	GLY	ALA	CYS	VAL	MET	ILE	LEU	TYR	PHE	HIS	LYS	NH4	ARG
74	31	24	11.86	2.51	4.74	21.86	4.09	6.17	3.87	0.78	4.06	0.69	3.37	6.71	4.57	5.12	2.86	3.57	1.83	11.36
74	31	25	11.72	2.41	4.80	21.68	4.04	6.77	3.78	0.79	3.83	0.66	3.35	6.79	4.57	4.86	2.78	3.72	1.87	11.57
74	31	26	11.66	2.65	4.90	21.91	4.01	6.07	3.81	0.84	4.39	0.88	3.38	6.64	4.60	4.98	2.88	3.45	1.77	11.15
74	31	27	11.70	2.43	4.77	21.84	4.09	6.74	3.74	0.86	3.78	0.84	3.28	6.47	4.43	5.08	2.62	3.69	1.90	11.72
74	31	28	11.72	2.51	4.80	21.87	3.99	6.32	3.82	0.77	4.07	0.91	3.32	6.63	4.48	4.95	3.00	3.77	1.68	11.38
74	31	29	11.76	2.55	4.76	21.71	4.09	6.29	3.90	0.72	4.12	0.62	3.38	6.69	4.59	5.15	2.91	3.69	1.71	11.36
74	31	30	11.87	2.36	4.66	22.03	4.05	6.28	3.79	0.79	3.83	0.69	3.34	6.73	4.46	4.98	2.70	3.67	1.79	11.98
74	31	31	11.91	2.46	4.74	22.24	4.14	5.72	3.88	0.77	3.98	0.69	3.34	6.68	4.53	5.03	2.93	3.56	1.75	11.65
74	41	2	12.00	2.49	4.81	21.99	4.29	5.75	3.85	0.72	4.18	0.69	3.37	6.60	4.49	5.23	2.81	3.45	1.83	11.44
74	41	3	11.95	2.55	4.87	21.78	4.34	5.82	3.83	0.80	4.28	0.71	3.38	6.54	4.60	5.27	2.77	3.37	1.92	11.21
74	41	4	11.88	2.50	4.78	21.85	4.14	5.85	3.83	0.74	4.21	0.79	3.47	6.61	4.49	5.08	2.96	3.63	1.83	11.36
74	41	5	11.88	2.50	4.71	22.01	4.19	5.80	3.85	0.72	4.21	0.71	3.41	6.62	4.53	5.17	2.68	3.43	1.92	11.65
74	41	6	12.00	2.48	4.72	22.03	4.11	5.57	3.87	0.75	4.26	0.75	3.39	6.65	4.58	5.18	2.75	3.38	1.78	11.76
74	41	7	11.90	2.51	4.74	21.97	4.15	5.90	3.85	0.71	4.24	0.73	3.43	6.64	4.56	5.24	2.86	3.55	1.72	11.28
74	41	9	11.79	2.51	4.71	21.81	4.07	5.94	3.83	0.84	4.19	0.97	3.42	6.61	4.54	4.91	2.99	3.73	1.77	11.36
74	41	11	11.94	2.52	4.76	22.10	4.14	5.61	3.83	0.80	4.23	0.76	3.41	6.65	4.55	5.07	2.76	3.48	1.74	11.62
74	41	12	11.94	2.51	4.82	21.87	4.15	5.90	3.85	0.83	4.23	0.85	3.36	6.68	4.65	5.01	2.73	3.35	1.72	11.55
74	41	13	11.83	2.63	4.77	21.84	4.22	5.77	3.89	0.77	4.47	0.84	3.43	6.66	4.61	5.18	2.83	3.34	1.87	11.06
74	41	14	11.90	2.48	4.75	22.05	4.21	5.75	3.83	0.77	4.19	0.74	3.35	6.61	4.57	5.10	2.80	3.50	1.74	11.65
74	41	15	11.84	2.55	4.84	22.04	4.16	5.85	3.87	0.79	4.21	0.78	3.39	6.61	4.61	4.97	2.88	3.63	1.66	11.31
74	41	19	11.81	2.37	4.77	21.69	4.11	6.47	3.84	0.82	3.83	0.61	3.34	6.68	4.55	5.04	2.74	3.63	1.69	12.03
74	41	20	11.76	2.42	4.77	21.84	4.05	6.53	3.86	0.90	3.80	0.71	3.37	6.63	4.48	4.91	2.75	3.64	1.71	11.87
74	41	21	11.87	2.52	4.79	21.73	4.29	5.33	3.88	0.73	4.19	1.56	3.36	6.47	4.55	5.12	2.81	3.46	1.95	11.40
74	41	22	11.77	2.50	4.70	21.47	4.20	5.96	3.82	0.67	3.97	1.45	3.39	6.43	4.38	5.08	2.82	3.76	1.89	11.73
74	41	23	11.65	2.52	4.88	21.34	4.22	5.97	3.83	0.63	3.97	1.67	3.38	6.45	4.46	5.09	2.88	3.73	1.91	11.41
74	41	24	11.69	2.47	4.76	21.62	4.18	6.13	3.77	0.72	3.91	1.53	3.35	6.49	4.46	5.08	2.81	3.71	1.90	11.42
74	41	25	11.70	2.47	4.77	21.54	4.13	6.57	3.88	0.69	3.77	0.81	3.38	6.45	4.52	5.19	2.81	3.75	2.02	11.56
74	41	26	11.81	2.63	4.86	21.80	4.29	5.57	3.87	0.74	4.34	1.13	3.42	6.49	4.55	5.18	2.71	3.29	1.90	11.41
74	41	27	11.73	2.35	4.71	21.74	4.19	6.20	3.74	0.69	3.68	1.34	3.32	6.46	4.42	4.97	2.66	3.76	1.89	12.16
74	41	28	11.64	2.53	4.82	21.55	4.15	6.06	3.80	0.71	4.01	1.37	3.35	6.47	4.45	5.12	2.89	3.75	1.97	11.36
74	41	29	11.72	2.50	4.70	21.53	4.26	5.84	3.88	0.62	3.99	1.50	3.40	6.50	4.45	5.11	2.83	3.69	1.96	11.51
74	41	30	11.84	2.35	4.69	21.90	4.24	5.88	3.82	0.74	3.70	0.91	3.32	6.54	4.42	5.14	2.65	3.61	2.19	12.05
74	41	31	11.81	2.47	4.71	21.89	4.16	5.87	3.84	0.79	3.93	1.09	3.35	6.44	4.49	5.33	2.77	3.54	1.96	11.56
74	51	2	11.81	2.40	4.63	21.67	4.44	5.73	3.59	0.82	4.42	0.80	3.40	6.67	4.79	5.36	2.78	3.53	1.51	11.64
74	51	3	11.95	2.42	4.75	22.03	4.22	5.82	3.65	0.55	4.30	0.86	3.62	6.79	4.64	4.88	2.82	3.48	1.61	11.60
74	51	4	11.69	2.44	4.78	21.28	5.12	5.72	3.54	0.69	4.25	1.04	3.77	6.65	4.55	5.10	2.67	3.37	2.03	11.31
74	51	5	11.50	2.40	4.67	21.02	4.92	5.89	3.75	0.75	4.31	0.89	4.07	6.87	4.52	5.20	2.63	3.31	1.85	11.45
74	51	6	12.07	2.52	4.81	21.98	4.36	5.68	3.74	0.77	4.47	0.87	3.64	6.75	4.67	4.49	2.64	3.40	1.47	11.66
74	51	7	11.92	2.45	4.73	21.77	4.38	5.63	3.63	0.84	4.36	0.58	3.59	6.60	4.73	5.31	2.78	3.48	1.39	11.84
74	51	9	12.02	2.36	4.55	21.60	4.21	6.51	3.82	0.96	4.15	0.85	3.29	6.63	4.72	4.92	2.78	3.69	1.39	11.57
74	51	11	11.94	2.48	4.73	21.45	4.32	5.46	3.68	0.89	4.36	0.96	3.94	6.84	4.61	4.91	2.61	3.42	1.67	11.71
74	51	12	11.66	2.38	4.67	21.71	4.54	6.18	3.88	0.97	4.39	0.76	3.35	6.51	4.52	4.99	2.86	3.47	1.50	11.67
74	51	13	11.61	2.53	4.78	21.43	4.19	6.19	3.98	0.94	4.67	0.82	3.34	6.49	4.66	5.20	2.96	3.45	1.50	11.26
74	51	14	11.97	2.45	4.66	21.75	4.46	5.75	3.63	0.88	4.42	0.59	3.59	6.51	4.66	5.04	2.74	3.47	1.53	11.87
74	51	15	11.76	2.46	4.71	21.44	4.42	6.44	4.12	0.95	4.37	1.01	3.09	6.34	4.82	5.24	2.88	3.44	1.39	11.13
74	51	19	12.12	2.32	4.81	22.20	4.43	6.38	3.68	0.69	3.81	0.73	3.53	6.90	4.32	4.47	2.53	3.42	1.07	12.58
74	51	20	12.08	2.28	4.66	22.06	4.36	6.22	3.62	0.64	3.88	0.50	3.50	6.84	4.55	4.80	2.69	3.57	1.30	12.45
74	51	21	12.07	2.55	4.82	21.93	4.33	5.68	3.74	0.85	4.30	0.63	3.33	6.64	4.92	4.96	2.86	3.34	1.39	11.67

TABLE 3. 1973-74 UPT % OF TOTAL (GRAMS AMINO ACID/100 GRAMS OF AMINO ACID) - MEAN OF TWO REPS

YR	L	V	ASP	THR	SER	GLU	PRO	GLY	ALA	CYS	VAL	MET	ILE	LEU	TYR	PHE	HIS	LYS	NH4	ARG
74	51	22	11.92	2.44	4.74	21.82	4.35	5.87	3.67	0.52	4.20	0.69	3.54	6.83	4.57	5.04	2.94	3.54	1.29	12.03
74	51	23	11.57	2.45	4.75	21.01	4.92	6.11	3.60	0.82	4.28	0.89	3.80	6.76	4.67	4.92	2.68	3.45	2.00	11.34
74	51	25	11.67	2.36	4.77	21.46	4.34	6.60	3.61	0.80	3.86	0.91	3.72	6.85	4.61	4.96	2.58	3.47	1.70	11.72
74	51	27	12.19	2.35	4.72	22.52	4.27	6.41	3.72	0.74	3.86	0.82	3.52	6.96	4.38	4.11	2.38	3.47	1.09	12.47
74	51	28	11.66	2.39	4.63	21.72	4.88	5.99	3.53	0.87	4.12	0.78	3.56	6.66	4.63	5.08	2.62	3.27	1.72	11.88
74	51	29	12.02	2.44	4.57	22.01	4.66	5.92	3.75	0.53	4.15	0.55	3.62	6.92	4.49	5.13	2.84	3.48	1.11	11.83
74	51	30	12.20	2.31	4.61	22.29	4.40	6.03	3.70	0.67	3.88	0.69	3.53	6.91	4.44	4.66	2.57	3.56	1.11	12.44
74	51	31	12.02	2.42	4.71	21.99	4.32	6.07	3.67	0.71	4.01	0.83	4.07	6.99	4.44	4.80	2.45	3.07	1.56	11.87
74	52	2	11.92	2.49	4.81	21.96	4.25	5.67	3.80	0.75	4.18	0.86	3.41	6.52	4.51	5.31	2.67	3.35	1.96	11.56
74	52	3	11.96	2.52	4.95	21.84	4.26	5.66	3.84	0.77	4.11	0.86	3.35	6.51	4.63	5.29	2.69	3.35	1.86	11.54
74	52	4	11.93	2.55	4.99	21.71	4.29	5.78	3.87	0.72	4.17	0.65	3.37	6.55	4.52	5.30	2.74	3.39	2.01	11.45
74	52	5	11.83	2.52	4.80	21.78	4.19	5.84	3.82	0.71	4.20	0.78	3.42	6.49	4.54	5.32	2.70	3.40	2.17	11.49
74	52	6	11.98	2.50	4.83	22.03	4.25	5.68	3.84	0.74	4.20	0.81	3.41	6.54	4.43	5.32	2.70	3.38	1.97	11.39
74	52	7	11.99	2.50	4.82	21.99	4.30	5.60	3.85	0.70	4.14	0.75	3.39	6.59	4.39	5.30	2.66	3.38	2.00	11.66
74	52	9	11.73	2.55	4.86	21.64	4.11	6.10	3.83	0.81	4.14	0.97	3.38	6.56	4.55	5.11	2.74	3.44	2.17	11.30
74	52	11	11.86	2.48	4.81	21.83	4.19	5.53	3.78	0.82	4.15	1.06	3.39	6.48	4.57	5.23	2.67	3.35	2.07	11.73
74	52	12	11.92	2.53	4.88	21.85	4.31	5.66	3.81	0.87	4.17	0.80	3.35	6.54	4.63	5.15	2.67	3.31	1.91	11.63
74	52	13	11.80	2.62	4.79	21.92	4.24	5.45	3.83	0.80	4.45	0.95	3.41	6.54	4.56	5.13	2.76	3.35	1.95	11.44
74	52	14	11.88	2.51	4.85	21.92	4.26	5.62	3.82	0.77	4.21	0.90	3.39	6.48	4.56	5.35	2.67	3.32	1.96	11.53
74	52	15	11.74	2.52	4.95	21.63	4.19	5.91	3.80	0.83	4.20	0.78	3.41	6.52	4.62	5.25	2.84	3.41	2.08	11.31
74	52	19	11.76	2.38	4.82	21.62	4.16	6.40	3.80	0.85	3.80	0.86	3.32	6.57	4.45	5.04	2.61	3.58	2.00	11.98
74	52	20	11.67	2.37	4.87	21.61	4.09	6.50	3.75	0.83	3.78	0.91	3.33	6.52	4.37	4.98	2.78	3.71	1.97	11.96
74	52	21	11.83	2.59	4.88	21.73	4.33	5.79	3.88	0.56	4.34	0.79	3.42	6.59	4.65	5.29	2.76	3.29	1.93	11.34
74	52	22	11.65	2.56	4.97	21.52	4.07	6.21	3.82	0.71	4.11	0.93	3.37	6.54	4.58	5.33	2.85	3.49	1.99	11.29
74	52	23	11.72	2.54	4.94	21.60	4.24	6.04	3.84	0.67	4.14	0.86	3.38	6.53	4.51	5.13	2.72	3.52	1.99	11.63
74	52	24	11.75	2.51	4.83	21.60	4.14	6.28	3.84	0.64	4.10	0.98	3.33	6.54	4.58	5.21	2.76	3.53	2.02	11.35
74	52	25	11.73	2.45	5.01	21.43	4.16	6.40	3.83	0.73	3.80	0.82	3.33	6.53	4.51	5.02	2.78	3.57	1.98	11.92
74	52	26	11.64	2.61	4.88	21.87	4.14	5.79	3.82	0.68	4.35	1.06	3.38	6.52	4.63	5.24	2.79	3.40	1.99	11.21
74	52	27	11.79	2.36	4.78	21.91	4.15	6.27	3.73	0.83	3.74	0.92	3.31	6.58	4.46	5.00	2.56	3.54	1.94	12.09
74	52	28	11.76	2.52	4.86	21.79	4.09	5.99	3.81	0.69	4.06	0.79	3.37	6.59	4.53	5.18	2.73	3.46	2.06	11.72
74	52	29	11.76	2.56	4.90	21.62	4.24	6.19	3.85	0.68	4.11	0.70	3.37	6.54	4.56	5.22	2.79	3.51	1.95	11.45
74	52	30	11.82	2.35	4.81	22.05	4.11	6.10	3.75	0.85	3.74	0.93	3.30	6.60	4.50	5.04	2.63	3.50	1.90	12.01
74	52	31	11.86	2.46	4.84	21.91	4.27	5.96	3.79	0.69	3.97	0.84	3.31	6.61	4.55	5.26	2.69	3.33	1.95	11.71
74	61	2	11.68	2.47	4.73	21.73	4.27	5.55	3.76	0.69	4.00	0.71	3.20	6.50	4.59	5.84	2.89	3.51	1.77	12.12
74	61	3	12.32	2.55	4.96	22.66	4.53	5.88	3.99	0.62	4.36	0.64	3.51	6.95	4.73	5.52	3.04	3.59	1.93	8.22
74	61	4	12.31	2.54	4.88	22.71	4.49	5.57	3.92	0.61	4.24	0.70	3.43	6.76	4.53	5.17	2.86	3.46	1.88	9.93
74	61	5	11.95	2.45	4.59	22.18	4.37	5.58	3.84	0.53	4.22	0.69	3.37	6.65	4.44	5.39	2.85	3.52	1.79	11.59
74	61	6	12.09	2.52	4.94	22.18	4.48	5.49	3.84	0.62	4.09	0.97	4.12	7.09	4.23	5.45	1.99	2.70	1.91	13.27
74	61	7	12.06	2.45	4.75	22.28	4.44	5.50	3.80	0.63	4.04	1.05	4.07	7.04	4.28	3.88	1.96	2.66	1.81	13.32
74	61	9	11.95	2.57	4.91	22.42	4.34	5.85	3.88	0.68	4.13	1.01	3.75	7.08	4.24	3.32	2.14	2.85	1.95	12.94
74	61	13	11.77	2.56	4.82	22.23	4.32	5.52	3.83	0.64	4.21	0.82	3.36	6.68	4.49	4.32	2.44	3.01	2.11	12.86
74	61	14	12.01	2.48	4.77	22.29	4.44	5.55	3.79	0.65	4.11	1.12	4.01	7.03	4.24	3.60	1.95	2.74	1.87	13.34
74	61	19	11.62	2.32	4.76	21.67	4.29	6.17	3.67	0.70	3.62	1.07	3.96	6.88	4.20	4.27	2.33	3.20	1.89	13.37
74	61	20	11.80	2.39	5.15	21.74	4.30	6.13	3.74	0.72	3.66	1.06	4.09	7.09	4.10	3.52	2.25	2.87	1.93	13.45
74	61	21	11.75	2.58	5.15	21.50	4.49	5.56	3.81	0.68	4.23	0.97	3.87	6.89	4.42	4.03	2.42	2.81	1.97	12.85
74	61	22	11.74	2.50	4.73	21.86	4.30	5.91	3.77	0.63	3.99	1.05	4.12	7.07	4.26	3.86	2.22	3.07	1.86	13.05
74	61	23	11.59	2.45	4.91	21.52	4.36	5.92	3.69	0.71	3.91	1.12	4.02	6.93	4.35	4.37	2.42	3.12	1.88	12.72
74	61	24	11.63	2.49	5.03	21.58	4.35	6.26	3.73	0.69	3.90	1.00	3.97	6.88	4.20	3.97	2.53	3.10	1.94	12.76

TABLE 3. 1973-74 UPT % OF TOTAL (GRAMS AMINO ACID/100 GRAMS OF AMINO ACID) - MEAN OF TWO REPS

YR	L	V	ASP	THR	SER	GLU	PRO	GLY	ALA	CYS	VAL	MET	ILE	LEU	TYR	PHE	HIS	LYS	NH4	ARG
74	61	25	11.78	2.41	4.84	21.66	4.37	6.39	3.76	0.60	3.72	1.02	4.05	7.03	4.03	4.02	2.12	3.01	1.90	13.30
74	61	26	11.79	2.61	4.86	22.05	4.35	5.55	3.81	0.60	4.27	1.08	3.80	6.84	4.29	4.13	2.40	3.03	1.82	12.72
74	63	2	11.96	2.50	4.82	21.89	4.27	5.66	3.84	0.70	4.17	0.91	3.40	6.53	4.54	5.23	2.71	3.44	1.92	11.52
74	63	3	11.97	2.50	4.82	21.76	4.38	5.55	3.86	0.61	4.13	0.88	3.42	6.51	4.57	5.27	2.70	3.44	1.93	11.71
74	63	4	11.95	2.51	4.85	21.74	4.33	5.63	3.86	0.66	4.10	0.68	3.40	6.49	4.53	5.22	2.74	3.46	1.94	11.86
74	63	5	11.88	2.46	4.78	21.69	4.32	5.59	3.82	0.64	4.09	0.94	3.38	6.50	4.57	5.24	2.76	3.58	1.93	11.83
74	63	6	12.01	2.55	4.87	21.82	4.25	5.61	3.88	0.68	4.20	0.65	3.42	6.56	4.56	5.28	2.68	3.39	2.01	11.57
74	63	7	12.00	2.49	4.83	21.98	4.34	5.61	3.85	0.60	4.16	0.79	3.40	6.53	4.52	5.35	2.68	3.32	1.97	11.57
74	63	9	11.89	2.55	4.85	21.66	4.23	5.94	3.87	0.76	4.13	0.91	3.40	6.56	4.60	5.15	2.70	3.32	1.94	11.54
74	63	13	11.84	2.61	4.85	21.96	4.25	5.72	3.85	0.65	4.39	0.95	3.39	6.56	4.58	5.21	2.77	3.23	1.92	11.27
74	63	14	12.00	2.48	4.83	21.88	4.30	5.64	3.84	0.71	4.15	0.77	3.40	6.49	4.58	5.26	2.63	3.28	1.96	11.81
74	63	19	11.78	2.35	4.77	21.70	4.24	6.87	3.75	0.70	3.79	0.75	3.34	6.58	4.43	4.98	2.62	3.59	1.89	11.86
74	63	20	11.87	2.37	4.87	21.89	4.15	6.31	3.77	0.70	3.75	0.81	3.29	6.61	4.52	4.96	2.61	3.48	1.94	12.09
74	63	21	11.91	2.55	4.81	22.00	4.34	5.44	3.91	0.51	4.33	0.86	3.42	6.59	4.59	5.30	2.70	3.18	1.91	11.64
74	63	22	11.75	2.52	4.72	21.94	4.27	6.17	3.85	0.62	4.09	0.78	3.39	6.48	4.52	5.19	2.78	3.55	1.89	11.49
74	63	23	11.75	2.53	4.89	21.75	4.23	6.15	3.84	0.56	4.09	0.77	3.41	6.53	4.57	5.10	2.75	3.59	1.90	11.58
74	63	24	11.81	2.49	4.79	21.76	4.21	6.43	3.85	0.73	4.08	0.82	3.36	6.61	4.61	5.16	2.74	3.42	1.80	11.37
74	63	25	11.84	2.42	4.74	21.66	4.22	6.68	3.82	0.53	3.87	0.62	3.37	6.57	4.51	5.08	2.64	3.61	1.91	11.90
74	63	26	11.67	2.62	4.78	21.42	4.34	5.55	3.90	0.66	4.53	1.02	3.44	6.67	4.51	5.13	2.85	3.28	2.11	11.52
74	71	2	11.77	2.52	4.63	21.76	4.22	5.36	3.88	0.58	4.07	1.18	4.33	6.97	4.50	5.10	2.80	3.37	1.69	11.28
74	71	3	11.78	2.54	4.70	21.79	4.34	5.41	3.88	0.64	4.06	1.09	4.24	7.03	4.47	5.06	2.79	3.35	1.52	11.31
74	71	4	11.86	2.54	4.69	21.71	4.30	5.40	3.91	0.63	4.08	1.11	4.24	6.92	4.48	5.08	2.81	3.36	1.55	11.32
74	71	5	11.78	2.56	4.74	21.55	4.27	5.46	3.98	0.60	4.10	1.01	4.09	6.88	4.52	5.03	2.83	3.44	1.73	11.31
74	71	6	11.85	2.55	4.72	21.73	4.28	5.28	3.93	0.63	4.11	1.02	4.20	6.91	4.53	5.11	2.82	3.36	1.57	11.38
74	71	7	11.68	2.62	4.72	21.73	4.17	5.45	3.90	0.60	4.19	1.14	4.20	6.93	4.48	5.03	2.95	3.46	1.62	11.13
74	71	9	11.74	2.61	4.81	21.58	4.23	5.79	3.94	0.58	4.04	0.92	4.05	7.02	4.55	4.97	2.95	3.53	1.61	11.07
74	71	11	11.79	2.47	4.66	22.09	4.23	5.15	3.83	0.70	4.02	1.22	4.32	7.05	4.41	5.02	2.71	3.26	1.71	11.33
74	71	12	11.77	2.59	4.90	21.40	4.26	5.43	3.90	0.55	4.03	1.05	4.11	6.84	4.50	5.02	3.03	3.39	1.68	11.52
74	71	13	11.73	2.60	4.80	21.45	4.18	5.69	4.04	0.66	4.23	0.89	3.88	6.78	4.65	5.17	2.99	3.45	1.52	11.30
74	71	14	11.83	2.57	4.76	21.59	4.23	5.36	3.91	0.58	4.05	1.12	4.26	6.92	4.53	5.01	2.82	3.39	1.62	11.46
74	71	15	11.88	2.57	4.75	21.87	4.30	5.60	3.92	0.47	4.16	0.80	3.85	6.86	4.57	5.05	2.86	3.45	1.49	11.52
74	72	2	11.87	2.52	4.80	21.47	4.42	5.40	3.82	0.66	4.04	0.94	4.14	6.96	4.29	4.21	2.24	3.03	2.03	13.16
74	72	3	11.90	2.55	4.80	21.39	4.41	5.48	3.82	0.67	4.06	0.92	4.18	6.95	4.33	4.28	2.33	3.10	1.90	12.92
74	72	4	11.79	2.58	4.86	21.60	4.32	5.54	3.82	0.59	4.03	1.01	4.14	6.87	4.44	4.95	2.63	3.35	1.65	11.85
74	72	5	11.70	2.58	4.76	21.83	4.27	5.57	3.89	0.50	4.13	0.98	3.91	6.88	4.42	5.46	2.92	3.47	1.58	11.17
74	72	6	11.71	2.54	4.61	21.84	4.31	5.30	3.88	0.63	4.11	1.19	4.32	7.12	4.48	5.16	2.73	3.34	1.54	11.19
74	72	7	11.72	2.55	4.68	21.72	4.27	5.40	3.87	0.61	4.10	1.16	4.21	6.91	4.52	5.25	2.82	3.37	1.58	11.26
74	72	9	11.57	2.59	4.66	21.64	4.25	5.79	3.90	0.56	4.12	1.16	4.31	7.00	4.48	4.97	2.90	3.47	1.58	11.04
74	72	11	12.05	2.58	4.85	21.85	4.42	5.37	3.87	0.68	4.14	1.00	4.23	7.05	4.27	3.57	2.08	3.05	1.95	13.00
74	72	12	11.74	2.55	4.64	21.55	4.37	5.60	3.97	0.55	4.13	0.93	4.11	6.87	4.52	5.06	2.83	3.40	1.61	11.57
74	72	13	11.59	2.65	4.99	21.35	4.30	5.53	3.94	0.49	4.21	1.05	4.21	6.88	4.59	4.96	3.11	3.37	1.58	11.19
74	72	14	11.70	2.54	4.66	21.92	4.25	5.42	3.85	0.58	4.18	1.11	4.14	6.88	4.53	5.22	2.82	3.37	1.55	11.27
74	72	15	11.51	2.52	4.83	21.22	4.37	5.56	3.82	0.61	4.15	1.14	4.39	7.12	4.61	5.04	2.98	3.33	1.68	11.12
Mean			11.87	2.51	4.79	21.92	4.22	5.83	3.84	0.73	4.12	0.84	3.50	6.67	4.51	5.05	2.76	3.42	1.72	11.69
Minimum			11.42	2.28	4.48	21.01	3.93	5.15	3.53	0.47	3.62	0.50	3.09	6.34	4.03	3.32	1.95	2.66	1.07	8.22
Maximum			12.51	2.67	5.28	22.71	5.12	6.87	4.12	1.11	4.67	1.67	4.38	7.12	4.92	6.16	3.12	3.90	2.32	13.45
C.V.			1.33	2.92	2.19	1.19	3.42	5.64	2.16	15.4	4.56	19.2	6.81	2.12	2.92	6.17	5.93	4.96	13.1	3.98

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Fffects of Row Spacing, Weed-free Maintenance Periods and Herbicide Systems on the Yield of Florunner Peanuts. E. W. Hauser, Science and Education Administration, USDA, CPES, Tifton, GA, G. A. Buchanan, Auburn University, Auburn, AL, and J. W. Slaughter, SEA-USDA, CPES, Tifton, GA.

Peanuts [Arachis hypogaea (L.) 'Florunner'], infested with sickle pod (Cassia obtusifolia L.) were grown in 20, 40 and 80 cm rows on a Dothan sandy loam at Headland, AL, and on a Greenville sandy clay loam at Plains, GA. The peanuts were maintained free of sicklepod for 0, 2 and 5 wks. or throughout the season. Weeds other than sicklepod were removed by hand. Herbicide systems included (a) benefin alone as a preplant incorporated treatment; (b) benefin, then a mixture of alachlor + naptalam-dinoseb applied at "cracking" time and (c) benefin, the "cracking" mixture, then dinoseb about 2 wks. later. In 1977, the standard amount of Florunner peanut seed per cm of row was planted. In 1978, the standard rates of seeding per cm of row were compared to (a) 10% reduction for 80 cm rows, (b) a 25% reduction for 40 cm rows and (c) a 50% reduction for rows 20 cm apart. Peanuts yielded about 15% more in 20 and 40 cm rows than in standard 80 cm rows. Downward adjustments in seeding rates reduced the yield increase due to row spacing by 1 to 3%. As compared with benefin applied alone, sequentially applied herbicides increased yields about 25% and the increases were due to sicklepod control. Reductions in weight of weeds were fairly well correlated with crop yield increases except for the row spacing variables. Weed weights were reduced more in 20 cm rows than in 40 cm rows but, unlike previous studies, the differences were not reflected in crop yields.

Development of A Peanut Sheller for Laboratory and Industrial Applications. James I. Davidson, Jr. National Peanut Research Laboratory, Dawson, Georgia and R. F. Hudgins. Paul Hattaway Company, Cordele, Georgia.

A small peanut sheller was developed for use in research studies and for use in setting up commercial shelling plants for optimum performance. This sheller was developed by improving the design of the Model 3 National Peanut Research Laboratory peanut sheller; expanding the improved sheller to a three-compartment unit; and developing a two-deck vibrating screen to fit underneath the three-compartment sheller. Improvements in the design of the Model 3 sheller included an improved cylinder design to provide automatic cleanout and an improved grate design to minimize mechanical damage to the seed. The three-compartment unit allowed the use of presizing to obtain a shelling efficiency in excess of 95 percent and a continuous shelling rate of 136 to 272 Kg./hr. The outturns of the three-compartment sheller correlated well with the outturns of the Model 3 and commercial-type shellers. The two-deck vibrating screen made the necessary separations and seed sizes eliminating a tremendous amount of labor that is commonly required for small shelling apparatuses. Drawings and specifications are provided to allow purchase of models for specific research and industrial applications. Cost (1979) of sheller varied from $2,000 to $3,000 depending upon the model specified.

Net Photosynthetic Efficiency and Partitioning of Photosynthate in Peanut Cultivars. S. T. Ball, J. C. Wynne and T. G. Isleib. North Carolina State University.

The yield of peanuts (Arachis hypogaea L.) may be expressed as the product of two major physiological components: net photosynthetic efficiency and subsequent partitioning of the photosynthate to the fruits. It has been proposed that hybridization of parents with high net photosynthetic efficiency and parents with efficient partitioning would lead to higher yields by maximizing the probability of obtaining genotypes with an optimal balance of these two physiological processes.

In a field study of eight cultivars in North Carolina significant variation in net photosynthetic efficiency and partitioning of photosynthate was observed. Genotypic correlations for net photosynthetic efficiency (biological yield) with economic yield and partitioning (harvest index) were low ($r = 0.44$ and -0.28, respectively); however, the correlation of economic yield and harvest index was high ($r = 0.73$). In a separate study a Spanish cultivar had less biological yield, economic yield and a lower harvest index than a Virginia cultivar. Split applications of nitrogen increased biological yield and economic yield of both cultivars but only decreased the harvest index for the Virginia cultivar.

These studies indicate that the potential of increasing peanut yields by hybridization of parents with divergent physiological processes exists. This hypothesis is being evaluated in further field studies in North Carolina.

Non-target Effects of the Insecticide Chlorpyrifos to Certain Soil-borne Peanut Pathogens. John M. Hammond. Dept. of Botany-Microbiology, Auburn University Agricultural Experiment Station, Auburn, AL 36830.

Two formulations of the insecticide chlorpyrifos (O,O, Diethyl-O-(3,5,6-trichloro-2-pyridyl phosphorothioate)) were evaluated in field-grown peanuts (Arachis hypogaea L.) for control of lesser cornstalk borer (Elasmopalpus lignosellus (Zeller)). Effective control of this pest was achieved with the 15G formulation applied at a rate of 1 lb ai/acre. Additionally, a significant reduction in numbers of dead plants caused by the soil-borne pathogen Sclerotium rolfsii was observed in plots treated with the 4EC formulation applied by the drop-nozzle technique at a rate of 1 lb ai/acre. Laboratory evaluations using both treated soil and chlorpyrifos-amended potato-dextrose agar indicated a severe fungistatic effect by the chemical on S. rolfsii. Further laboratory evaluations using amended PDA confirmed this fungistatic effect against other soil-borne pathogens of peanuts. These pathogens included Pythium spp., Rhizoctonia solani, Sclerotinia sclerotiorum and Fusarium sp. These data indicate that the insecticide chlorpyrifos is effective against the lesser cornstalk borer and additionally possesses fungicidal activity against a broad spectrum of soil-borne fungi.

A Day in the Life of the Peanut. J. E. Pallas, Jr. USDA-SEA-AR, Southern Piedmont Conservation Research Center, Watkinsville, Georgia.

This report summarizes recent laboratory observations concerning the physiology of the cultivated peanut. The information is primarily directed toward those that may not keep up with the more technical literature but wish to be aware of recent important findings concerning peanut physiology. Salient points on peanut photosynthesis and photorespiration, water relations including transpiration, stomatal operation and plant water potential and leaf anatomy are to be stressed. Evidence for internal programming and control of the foregoing peanut processes have been found and their interrelationship with yield potential is important. Some documentation of findings and a demonstration of uniqueness in peanut physiology will be shown on film in the form of time lapse photograpy.

Reduction of Sporulation of *Cercosporidium personatum* by Hansfordia in Texas. Ruth Ann Taber and Robert E. Pettit. Plant Sciences Department, Texas A&M University. Robert E. McGee and Donald H. Smith. Plant Disease Research Station, Yoakum, Texas; Texas Agricultural Experiment Station.

This is the first report of the association of the fungus Hansfordia with Cercosporidium personatum leafspot on peanuts in the United States. Hansfordia is an imperfect fungus that was found to colonize peanut leafspots in Wilson, Atascosa, and Frio Counties in 1978. The fungus was not observed in Lavaca County although severe epidemics of late leafspot also occurred there. Hansfordia was isolated in pure culture and inoculated onto peanut leaves with well developed early leafspots caused by Cercospora arachidicola, late leafspots (C. personatum), and healthy leaves of peanuts grown in the greenhouse. Hansfordia colonized only the late leafspots. Colonization was evident 48 hours after inoculation and hyphae covered the leafspots within 72 hours. Light microscopic observations and scanning electron microscopy revealed complete absence of sporulation of Cercosporidium on colonized leafspots. Hansfordia was associated with stromatic cells of Cercosporidium and prevented sporulation. Neither early leafspots nor healthy leaves were colonized. The mode of colonization and possibility of using Hansfordia as a biological control for late leafspot is being studied.

CGA 64251: A Promising New Fungicide for Control of Southern Blight and Cercospora Leafspot of Peanuts. B. L. Jones, Texas A&M Univ., Texas Agr. Expt. Sta. Res. and Ext. Ctr., Stephenville, Texas, D. H. Smith, and R. E. McGee, Texas A&M Univ., Texas Agr. Expt. Sta., Plant Dis. Res. Sta., Yoakum, Texas.

CGA 64251 (10G) was evaluated for control of southern blight (caused by Sclerotium rolfsii) in a small plot test in North Texas. Yields of Florunner peanuts were 3868, 3888, and 4274 kg pods per ha with treatment rates of 280, 560, and 841 g a.i. per ha, respectively. These data were not significantly different (DMR .05), but the yield (971 kg per ha) for the control treatment was significantly less than yields from each of the CGA treatments. The percentage of damaged kernels (7.6) in the control treatment was significantly higher than in the CGA treatments. The efficacy of CGA 64251 (0.846EC) against S. rolfsii was evaluated in an in vitro test with fungicide amended Difco potato dextrose agar. The colony diameter of S. rolfsii after incubation for 72 hours at 25.6 C in continuous light was 72, 68, 47, 28, 6, 0, and 0 mm for the control, benomyl (5.0 ppm a.i.) and CGA 64251 (0.41, 2.02, 5.05, 10.04, and 24.75 ppm a.i., respectively). At 5.05 and 10.04 ppm of CGA 64251 colony morphology of S. rolfsii was atypical, and sclerotial formation was retarded. CGA 64251 (0.846EC) was evaluated for control of Cercospora leafspot in South Texas. The defoliation percentages at 129 days after planting were 8.1, 13.5 and 64.9 for Bravo 6F (1260 g a.i. per ha) CGA 64251 (119 g a.i. per ha) and the control treatment, respectively. The defoliation percentage of the control treatment was significantly higher than that of Bravo 6F and CGA 64251; however, the differences in defoliation for the Bravo 6F and CGA 64251 treatments were not statistically different. The yield of the CGA 64251 treatment was significantly higher than the control, but the yield of the Bravo 6F treatment was not significantly higher than the yield of the control. Differences in yields from the Bravo 6F and CGA 64251 plots were not significantly different. Because of the effectiveness of CGA 64251 against both Cercospora leafspot and southern blight, additional evaluation of this experimental compound is warranted.

Effect of Fungicides, Applied Through Irrigation, on Fungal Populations in Soil.
H. A. Melouk and R. V. Sturgeon, Jr. USDA-SEA, AR, and Department of Plant Pathology, Oklahoma State University., Stillwater, OK.

Bravo 500 (1.75 and 2.92 l/ha), DuTer (0.56 Kg/ha), Dithane M-45 (2.24 Kg/ha), Kocide 404 S (1.89 l/ha) and a mixture of 0.28 Kg Benlate 50 W + 1.68 Kg Manzate 200/ha were used for the control of Cercospora leafspot on the peanut cultivar 'Tamnut 74' grown in a Pond Creek fine sandy loam soil in Caddo county, Oklahoma in 1978. Four applications of each fungicide were made through a center pivot irrigation system equipped with a proportioning injector pump. Two to three days after application of fungicides, soil samples were collected from the top 20 cm, bench dried (moisture content, ca. 2-5%), passed through 16 mesh screen, and stored at 4 C until assayed. Total fungus populations in the samples were determined by a dilution plate technique on a modification of Kerr's medium which contained the following: $NaNO_3$, 2.0g; KH_2PO_4, 1.0g; KCl, 0.5g; $MgSO_4.7H_2O$, 0.5g; $FeSO_4$, 0.01g; sucrose, 30.0g; yeast extract (Difco), 0.5g; Streptomycin sulfate, 0.1g; tetracycline. HCl, 0.05g; agar, 15.0g and 1000 ml of distilled water. Fungal populations remained stable throughout the growing season in non-treated control plots and in plots treated with Kocide or Benlate + Manzate. There was a gradual decrease in fungal populations in plots treated with Bravo 500, DuTer, and Dithane M-45.

Development of *Cercosporidium personatum* in Three Peanut Canopy Layers. J. L. Plaut and R. D. Berger. Univ. of Florida, Gainesville.

Disease progress of late leafspot caused by Cercosporidium personatum (Berk. & Curt.) Deighton was monitored on the variety 'Florunner' in unsprayed plots and in plots sprayed weekly with chlorothalonil (635 ml/1000 L/ha). The peanut canopy was divided into three vertical semicircular leaf layers, each 15-cm high Proportions of visible disease (x_v) and defoliation (d) per leaf layer were estimated with a modified Horsfall-Barratt rating system. The proportion of total disease (x_t) in each leaf layer and per plant was calculated with the equation $x_t=(1-d)\ x_v + d$. The apparent infection rates (*sensu* Vanderplank) were calculated for x_v, d, and x_t in each leaf layer and for the total plant canopy. The rates of disease increase on sprayed and unsprayed tissue were not significantly different ($P=0.05$). Disease incidence in plots sprayed with chlorothalonil lagged five to six days behind disease in unsprayed plots. Although the disease incidence was greatest in the lower canopy with each disease estimation method, visible disease increased at approximately the same rate in all leaf layers. The rate of defoliation in the upper leaf layer of unsprayed plots was significantly slower ($P=0.05$) than that in the other two leaf layers, possibly because of dilution by new plant growth. Chlorothalonil sprays reduced initial disease but did not reduce the rate of increase of C. personatum.

A Soil-borne Virus Disease of Peanuts in India. D.V.R. Reddy, N. Iizuka, P. Subrahmanyam, R. Rajeswari and D. McDonald, ICRISAT, Hyderabad, India.

A peanut disease characterised by severe stunting of plants was found in Punjab and Gujarat States in 1977 and in Andhra Pradesh State in 1978. Leaves were reduced in size and dark green, and newly unfolded leaves showed mosaic mottling and chlorotic rings. The disease occurred in patches in the field and reappeared in the same positions in succeeding peanut crops. Severely affected plants did not produce mature pods and even late infection, characterised by less severe stunting, reduced yields greatly.

Seeds sown in soil collected from around infected plants gave rise to plants with typical disease symptoms. The disease was also transmitted by grafting and by mechanical sap inoculations, indicating that a sap transmissible virus was involved. Phaseolus vulgaris (French bean cv. Prince) and Canavalia ensiformis were found to be good diagnostic hosts. The virus was purified by organic solvent clarification, precipitation with polyethylene glycol and rate and quasiequilibrium zonal density gradient centrifugation in sucrose solutions. Total infectivity present in starting plant material was recovered from purified virus preparations which also produced typical disease symptoms when mechanically inoculated on peanuts. Virus particles were rod shaped and 200-700 nm in length.

Application of nematicides to the soil reduced incidence and spread of the disease but no definite association of the disease with potential virus-transmitting nematodes could be demonstrated. It was found that roots of diseased plants from all three States where the condition was found were commonly infected with species of Olpidium, one of which has been identified as Olpidium brassicae (Woron.) Dang. Preliminary investigations indicate that these fungi may be involved in transmission of the virus.

Comparison of Pod and Seed Screening Methods on *Aspergillus* Colonization of Peanut Genotypes. Aubrey C. Mixon. USDA-SEA-AR, Tifton, GA.

In laboratory studies, six peanut genotypes grown at three locations were tested for the influence of three screening methods on seed colonization by *Aspergillus paraciticus* Speare. These genotypes had been identified as having varying levels of resistance to seed colonization by *Aspergillus* sp in laboratory screening. For the genotypes, there was no difference between the pod and seed inoculation on the subsequent seed colonization, but uninoculated seed (incubated similarly to the inoculated samples) exhibited considerably less colonization. For all three methods, seed colonization was consistently less for the resistant genotypes than for the 'Florunner' variety or the highly susceptible (P.I. 343419) check. There was a location x genotype interaction but the resistant genotypes largely had less colonization than the susceptible ones for each location. Pod inoculation resulted in a noticeable reduction in seed colonization of the more susceptible genotypes when these same genotypes were compared to seed inoculation (genotype x method interaction). The seed screening method currently in use (seed inoculation) was equally or more effective in identifying genotypes resistant to *Aspergillus paraciticus*.

A Water Slurry Method of Extracting Aflatoxin From Peanuts. T. B. Whitaker, J. W. Dickens, and R. J. Monroe. USDA, SEA, SR, North Carolina State University, and R. J. Moore, Department of Statistics, North Carolina State University.

A water slurry method to extract aflatoxin from peanut meal was developed. Eleven hundred grams of peanut meal, and 1500 ml tap water are blended together for 3 minutes at medium speed. Blending water and meal together reduces the average particle size and distributes more uniformly the contaminated particles throughout the water. Sieving studies show that 94% of the peanut meal will pass through a number 100 U. S. Standard Sieve (149 microns) after blending with water as compared to 64% for peanut meal not blended in water. Also the coefficient of variation among the quantity of dry matter in 130 g slurry portions was 0.76 percent. Aflatoxin is then extracted from a 130-g portion of the water slurry (containing about 55 g of meal) by methods similar to that used by the Food Safety and Quality Service (FSQS), United States Department of Agriculture. Extracting aflatoxin from 130 g of water slurry reduced the required amount of methanol and hexane from 1650 and 1000 ml to 180 and 60 ml, respectively. Tests showed that on the average 16% more total aflatoxin was extracted by the slurry method than the FSQS method.

Evaluation of Free Amino Acid and Free Sugar Contents in Five Lines of Virginia Type Peanuts at Four Locations. Chintana Oupadissakoon, Clyde T. Young, North Carolina State University, and R. Walton Mozingo, Tidewater Research Station, Virginia Polytechnic Institute and State University.

Five lines of Virginia type peanuts, Florigiant (FG), NC 6, NC 17921 (FG x Florunner), NC 17922 (FG x Valencia), NC 17976 (x Spanhoma), were selected from the advanced breeding lines and the standard variety test. They were grown at 4 county locations, Martin (NC), Northampton (NC), Sussex (VA), and City of Suffolk (VA), with 3 replications (blocks) in randomized complete block design. Adjacent plots served as the second harvesting plot. Only the sound mature kernels were used for analysis. Free amino acid and free sugars were determined directly following a methanol: chloroform:water (60:25:15;v:v:v) extraction. Statistical analysis showed significant differences for varieties and locations. The variety effects were larger in the case of the free sugar contents. NC 6 had the largest quantity of glucose (0.12 mg/g), sucrose (37.45 mg/g), and stachyose (4.24 mg/g), while FG was highest in inositol (0.15 mg/g). In the case of free amino acids (μmoles/g), significant variety effects were observed for TSER (1.55-1.92), ALA (0.95-1.53), PC (1.28-1.50), VAL (0.42-0.62), and HIS (0.58-0.66). Peanuts grown at Northampton County (NC) have the highest quantities of inositol (0.16 mg/g), sucrose (32.39 mg/g), stachyose (4.63 mg/g), ASP (1.48 μmole/g), TSER (2.55), GLU (7.49), ALA (1.89), VAL (0.76), ILE (0.23), U4T (0.37) and HIS (0.78). The supplemental data of AMI value, calcium content, % SMK, % ELK, and yield are discussed.

Desolventization of Hexane Extracted Peanut Meal. Joseph Pominski, Henry M. Pearce, Jr., Harold P. Dupuy, and James J. Spadaro. USDA, SEA, Southern Regional Research Center, New Orleans, LA 70179.

For the production of edible peanut flour, solvent-extracted peanut meal will probably have to be desolventized to residual levels of 60 ppm or less, a difficult level to achieve. Two methods have been developed on a batch pilot-plant scale whereby residual solvents of 60 ppm or less in the meals were attained. Each method consists of two steps. The first step is common to both, that is the solvent-wet meal that contains about 50% hexane is heated to 180°F under 15 in Hg of vacuum to lower the residual hexane to below 1%. In the second step of the first method, the partially desolventized meal is "self-sparged" by moistening the meal to about 18% and heating at 155°-180°F for 30 minutes under atmospheric pressure. In the second step of the second method, the moisture content of the partially desolventized meal is increased to about 18% and "steam-sparged" by heating at 180°F under 20 in Hg of vacuum for 10 to 60 minutes. An analysis of variance for residual hexane showed that the presence of moisture while heating during the second steps of the processes affected the residual hexane at an extremely high level of significance (>99%). The peanut flours obtained by grinding the resultant meals were essentially white and had protein solubilities of over 80% at pH 7.5. The information obtained can be used for scaling up the desolventization procedure to commercial scale operation.

Effects of Various Field Applications of Calcium, Magnesium and Potassium on the Quality of Peanuts for Salting. Sam R. Cecil and Milton E. Walker, University of Georgia; Georgia Station, Experiment, and Coastal Plain Station, Tifton.

Sound mature kernels from tests of various mineral applications were blanched and salted, scored for quality, and stored at 22°C to determine shelf life. Oil, protein and mineral contents of raw samples with low and high salting yields were also determined. Samples included (a) Florunner, Tifrun, Gal94V, Florigiant and Early Bunch grown with and without gypsum and lime, (b) Florunner from trials of magnesium with dolomitic or calcitic lime, and (c) Florunner from tests of magnesium and potassium with and without irrigation. Use of gypsum increased plot, milling and salting yields; sensory scores and storage stability of salted peanuts; and oil, calcium and phosphorus contents of raw kernels; with decreases in protein, carbohydrate, ash and potassium contents. Lime, particularly calcitic, gave somewhat similar results in the magnesium trials (except reduced storage stability was indicated by increased carbonyl levels), but had little influence in the gypsum tests. Effects of magnesium were variable, with moderate increases in mineral contents of kernels (except in calcium) when used with lime but not with potassium. Effects of irrigation were also variable, with some increases in carbonyls (decreased stability) of salted peanuts and in calcium and phosphorus contents of raw peanuts. Applications of potassium, however apparently had no consistent effect on any characteristics of raw or salted samples.

Effect of Oven Drying Time on Peanut Moisture Determination. J. H. Young, T. B. Whitaker, P. D. Blankenship, G. H. Brusewitz, J. M. Troeger, J. L. Steele, and N. K. Person, Jr. North Carolina State University; USDA, North Carolina State University; National Peanut Research Lab, Dawson, Georgia; Oklahoma State University; Coastal Plain Station, Tifton, Georgia; Tidewater Research and Education Center, Suffolk, Virginia, and Texas A&M University.

A cooperative study was conducted by the authors during the fall of 1978 to investigate the effect of oven drying time on the indicated moisture content of peanuts. The procedure used was similar to the AOCS Official Method Ab 2-49 except that larger samples were used and drying times were varied. Tests were conducted at six locations on four peanut varieties at three moisture levels. Oven drying periods of 3, 6, and 24 hours were investigated at an oven temperature of 130°C. Increasing the drying time from 3 hours to 6 hours resulted in increased apparent moisture contents of 0.32, 0.71, and 1.46% dry basis at low (approximately 10.1% d.b.), medium (approximately 35.0% d.b.) and high (approximately 76.2% d.b.) moisture levels respectively. A further increase in drying time from six to twenty-four hours resulted in additional increases of 0.44, 0.61, and 0.74% dry basis for low, medium, and high moisture levels respectively.

Five Precleaning Systems for Peanut Warehouses. Paul D. Blankenship and James I. Davidson, Jr. National Peanut Research Laboratory, Dawson, Georgia and J. W. Willis. Damascus Peanut Company, Damascus, Georgia.

Five, low-cost, cleaning systems were installed at farmers stock warehouses to remove foreign material from peanuts between the top of loading elevators and the warehouses. The systems evaluated consisted of two stationary screeners, one mechanical roller screen, one mechanical tumbler-extractor, and one aspiration system. Three of the systems were obtained commercially and two of the systems were designed by NPRL engineers. The performances of the systems were evaluated during the 1978 harvest season. The mechanical systems removed more material but will require more maintenance. The tumbler-extractor removed the largest average weight of material (average of 4.5 Kg. of foreign material per metric ton of farmers stock peanuts). The aspiration system removed the largest volume of material (average of 0.333 cubic meters per metric ton of farmers stock peanuts). All systems were effective in removing portions of the foreign material and insects, reducing dust in the warehouse, and providing a means of alarming the management to problems with handling equipment. Total cost of the systems including installation (excluding any elevator extension) ranged from $1,400 to $3,115. Results of this study indicate that a vast potential exists for further improvement in warehouse precleaning systems to provide more effective removal of foreign material and insects.

Pod Rot Resistance: Germplasm Evaluation. T. E. Boswell, Olin D. Smith, and B. L. Jones. Texas Agricultural Experiment Station, Texas A&M University; Yoakum, Texas; College Station, Texas; and Stephenville, Texas.

Field evaluations of plant introductions, cultivars, and selections for resistance to Pythium myriotylum were conducted in replicated tests since 1972 on soils with histories of high pod disease incidence. Visual estimates of the percentage of damaged pod tissue were made on an individual plot basis.

Genotypes varied significantly in their susceptibility to pod rot diseases. Although the disease severity varied among tests, the comparative resistance of selected genotypes has been relatively consistent within the South Texas area. However, the comparative reactions of some genotypes differed considerably from those reported by other investigators, and some genotypes performed differently in South and North Texas. PI 365553, a late maturing, red-seeded Virginia-bunch introduction from Bolivia has the highest level of resistance that was tested in Texas. PI 341885 and Toalson have somewhat lower but useful levels of resistance. Goldin I and Florunner are among the more susceptible cultivars tested.

Pod Rot Resistance: Line Selection and Evaluation. Olin D. Smith and Thurman E. Boswell. Texas Agricultural Experiment Station, Texas A&M University.

The development of peanut lines with Pythium myriotylum pod rot resistance has been in progress using PI 341885 as a resistance source. Progenies from crosses with Tamnut 74 and Goldin 1 were evaluated on a progeny row basis by visual selection among and within rows for pod disease reaction and agronomic acceptability. No gain was apparent through selection among F_2 progeny rows as measured by the pod disease ratings of the F_4 bulks. Subsequent results have been more encouraging with a highly significant coefficient of correlation among the disease ratings of F_5 to F_7 rows from F_4 and F_5 plant selections. Preliminary results indicate that lines having yielding abilities equal or superior to both parents, and pod disease resistance equal to the most resistant parent have been selected.

Pod Rot Resistance: Structural Differences Among Tolerant and Susceptible Genotypes. Robert E. Pettit, Plant Sciences Department, Texas A&M University; Ruth Ann Taber, Plant Sciences Department, Texas A&M University; Olin D. Smith, Soil and Crop Sciences Department, Texas A&M University; Thurman E. Boswell, Plant Disease Research Station, Yoakum, Texas; Texas Agricultural Experiment Station.

Pod rot tolerant peanut pods from Plant Introduction (PI) 341885 and PI 365553 were compared structurally with two commercial varieties, Tamnut-74 and Golden I. Pods differed in thickness, cell compaction, sclerenchyma band uniformity, distribution of cells containing tannin and lignin, and overall pod strength. Pods of Tamnut-74 had the greatest variability in sclereid arrangement. The sclerenchyma band of PI 341885 varied in thickness while this band in PI 365553 was more uniform. Pods of PI 341885 contained more tannin compared to the other pod types and pods of PI 365553 contained more lignin like compounds. In terms of work (measured in Newton-centimeters) required to puncture the pods on a tensiometer, pods of PI 365553 required more work than PI 341885 which required more work than Tamnut-74. These results indicated that pod structure and chemical composition are correlated with the amount of work required for puncture. In addition, the amounts of tannin-like compounds appear to be related to tolerance to pod rot fungi.

Inheritance of Testa Color Variegation in *Arachis hypogaea* L. W. D. Branch and Ray O. Hammons. Univ. of Georgia, Coastal Plain Expt. Sta. and USDA-SEA-AR, Tifton, GA.

The inheritance of a variegated testa color was investigated in reciprocal hybridizations between the variegated (red on white) P.I. 274191 X solid red P.I. 371965 peanut genotypes. F_2 values were consistent with a genetic model for incomplete dominance with one locus, designated *V*. Microscopic examination showed that the *V* gene inhibited full development of the outer red epidermal layer of the testa. This inhibition exposed the underlying white cellular layer resulting in a variegation pattern. The recessive locus, *v*, interacts with the R_1, F_1, F_2, D_1, and D_2 loci to produce solid color testa phenotypes.

Wild Species in the Improvement of Groundnuts. I. Disease Reaction of Hexaploids. J. P. Moss, A. K. Singh, A. P. Burge and S. Bradley. ICRISAT, Hyderabad, India and Reading University, England.

Hexaploids involving A. hypogaea and three wild diploid species in section Arachis were exposed to Cercospora leaf spots in India and Malawi. (Proc. Aprea, 1977, 9:34)

Progenies from selected plants were grown in India and assessed on a 0 (Immune) to 5 (Susceptible) scale for Cercospora resistance and rust resistance.

The mean disease reactions to Cercosporidium personatum in India of unselected and selected plants respectively were 2.8 and 1.2, 1.5 and 1.6, and 2.8 and 1.4 for the three types of hexaploids.

Scores for rust reaction of unselected plants were 2.0, 1.9 and 2.3 for the three types of hexaploids.

Hexaploids selected for disease resistance, earliness and productivity have been backcrossed to A. hypogaea. Plants from BC_1 to BC_4 progenies, with chromosome numbers from 2n=40 to 2n=56, will be screened for disease resistance in India.

There is no correlation between leafspot incidence and defoliation for hexaploids derived from the resistant wild species, and leafspot and rust are not the only causes of defoliation.

Interspecific Hybridization Between Cultivated and Wild Peanut Species. H. T. Stalker and J. C. Wynne. North Carolina State University.

Arachis hypogaea L. hybridizes with one other tetraploid and at least eight diploid species of section Arachis. Although interspecific hybrids between the diploid and tetraploid species are sterile, fertility can be restored after colchicine treatment of vegetative tissues. Several 6x amphidiploids have been produced using different wild species. These hexaploids can either remain at the 60-chromosome level after being self-pollinated or lose chromosomes until stability is restored at 2x = 40. Derivatives from an interspecific 40-chromosome A. hypogaea (2n = 40) x GKP 10017 (2n = 20) hybrid population were morphologically variable for 47 plant characters, for yield and for leafspot resistance. Traits such as growth habit, pod and seed size, elongation of the constricted area between pods, nodulation and leaflet size were among the characters most altered by GKP 10017 germplasm. Transgressive segregates for yield were selected and plants resistant for Cercospora arachidicola and/or Cercosporidium personatum isolated. Although unfavorable linkages were present in many plants, selections from the interspecific hybrid population appear to have agronomic potential.

Genotype x Environment Interactions in the Testing of Peanut Lines for Oklahoma. K. E. Dashiell, J. S. Kirby and R. W. McNew. Department of Agronomy and Department of Statistics, Oklahoma State University, Stillwater.

Data from peanut performance tests from 1969 to 1978 were used to estimate genotype x environment interaction variance components for pod yield, % TSMK, % SS, % OK, % DK, and gross return per acre (or hectare). The objectives of this study were to use these variance components 1) to determine if it would be advantageous to select for cultivars that have superior performance for a specific location and 2) to determine the most efficient combination of years, locations, and replications to use when evaluating peanut lines.

By averaging the variance components (which were converted to percent of the total calculated variation) obtained from four independent data sets and then comparing their relative magnitudes there is evidence that genotypes do not perform consistently between irrigated and nonirrigated locations for % TSMK. There is little evidence that this interaction is present for gross returns per acre or any of the other traits studied. By varying the number of years, locations and replications used in a performance testing program the variance of the difference of two cultivars or lines was calculated for % TSMK, pod yield and gross return. The calculated variances indicate that when testing for gross return the performance testing program could be changed from 3 years, 3 locations, 2 replications to 2 years, 2 locations (one irrigated and one dryland), 5 replications while maintaining approximately the same level of accuracy and increasing the efficiency.

Breeding for Earliness in Spanish Peanuts. D. J. Banks and J. S. Kirby. USDA-SEA-AR and Oklahoma State University, Stillwater, Oklahoma.

In 1972 a breeding program was initiated in Oklahoma under the cooperative efforts of the U.S. Department of Agriculture and the Oklahoma Agricultural Experiment Station to develop early maturing varieties of Spanish peanuts with good yield potential and acceptable agronomic and quality characteristics. Such varieties would be useful in areas with short growing seasons. Crosses were made in 1972 and 1973 utilizing the very early maturing, but small-seeded Spanish peanut, 'Chico' (P.I. 268661) as the female parent and 'Comet', 'Spanhoma' (spanish types), Florida F-416, and 'Florunner' (runner types) as male parents. The criteria used for selection in the F_2 and subsequent generations were earliness, high pod yield potential, large pod and seed size, desirable pod shape, good basal pod cluster, and high market grade. Some increases were made in Puerto Rico during winter months to accelerate the number of generations prior to testing. Several advanced generation selections from these crosses have shown superiority in Oklahoma Trials in yield, pod and seed size and grade when compared to standard varieties harvested early or at normal times. Their advantage over standard Spanish varieties has been revealed as far north as Guelph (Ontario), Canada. In general the selections from the Chico by Comet crosses have been superior to the other crosses. Release of some of these lines as varieties or as germplasm for breeding purposes is underway.

Seed Size, Weight, Length, Germination and Calcium Characteristics of Apical and Basal Seeds from Four Peanut Cultivars. Gene A. Sullivan, Astor Perry, S. Kurt Hube, Ahmed Ali, and P. Celeste Dye. North Carolina State University, Raleigh, N. C. 27650.

Previous reports indicate differences in seed characteristics and quality between apical and basal seeds of peanuts, (Arachis hypogaea L.). Seeds from four cultivars (Florigiant, Avoca 11, N C 6 and Keel 32) were handshelled and separated into apical and basal seeds. Seeds were screened over slotted screens, weighed and measured for length. Seeds from each of five size categories were evaluated for germination quality and seed calcium content. Apical seeds are lighter, longer, and narrower in diameter than basal seeds. Free calcium content of the apical seeds averaged 30 ppm higher than basal seed. Apical and basal seeds performed equally in the standard germination tests except where low calcium content influenced results. Small seeds (those falling through a 17/64ths x 1 inch slotted screen) were lower in germination quality than larger seeds. The differences in characteristics of the seeds indicate that mechanical separation of apical and basal seeds may be possible and desirable.

A Non-destructive Method of Peanut Pod Maturity Classification. J. Stanley Drexler. Coastal Plain Experiment Station, Tifton, GA, and E. Jay Williams. Science and Education Administration, CPES, Tifton, GA.

An essentially non-destructive method is described for classifying the maturity of individual, fresh peanut [Arachis hypogaea (L.) 'Florunner'] pods. The classification system is composed of nine morphological maturity groups designated as classes one through nine. Class one includes the pods that are least mature with each subsequently numbered class representing a progressively greater degree of maturity; a fully mature pod is designated as class 9. Maturity classes 1-3 are based on shape and size relationships while maturity classes 4-9 are based on the color and structural characteristics of the mesocarp after partial removal of the pod exocarp.

The exocarp can be removed mechanically by gentle abrasion. Since this removal of the exocarp is non-destructive to the remaining pod structure and the enclosed seed, the pods can be used for subsequent qualitative and quantitative research investigations relative to pod maturity.

The system of classification may be used to determine the pod maturity distribution at any stage of plant development.

Maturative Changes in the Triacylglycerol Fraction of Peanut Oil. T. H. Sanders. National Peanut Research Laboratory, Dawson, GA 31742

Triacylglycerols from seven distinct maturity stages of Florunner peanuts were examined and found to increase substantially with maturity. The normal increase in 18:1 concentration was noted with maturity and relatively high concentrations of long chain fatty acids in the immature stages decreased with maturity. Stereospecific analysis revealed significant changes at each position of the triacylglycerol molecule; however, the fatty acid composition of the *sn*-3 position varied the most with maturity.

Anatomical Differences of Functional and Non-Functional Nodules of Peanuts (*Arachis hypogaea* L.). J. S. Calahan, Jr. Tarleton State University and Texas Agricultural Experiment Station, Stephenville, Texas.

Due to the increased incidence of non-functional nodules in the West Cross Timbers peanut growing region of Texas, an investigation was initiated to determine the anatomical differences in functional and non-functional nodules. This study is a portion of a concerted effort to find the cause of non-functional nodule formation in peanuts grown in the region. Root nodules were collected from field study plots at two week intervals throughout the 1978 growing season. Light microscopic examination of the sections revealed differences in the amounts of bacteria infected volume of functional and non-functional nodules. Less infected volume and larger vacuoles were prevalent in the cells of non-functional nodules. Scanning electron microscopy revealed dramatic differences in numbers of rhizobia. Cells of non-functional nodules were found to have fewer rhizobia than the cells of functional nodules which were found to be packed with rhizobia.

Effects of Foliar Application of Urea on Peanut Yield and Seed Quality. S. K. Pancholy and A. L. Guy. Florida A&M University, Tallahassee.

It has been reported that application of urea can induce higher urease activity in soybean cell cultures in vitro. Enzyme urease is rich in methionine and therefore, we hypothesized that application of urea to peanuts may induce higher urease activity and concomitantly more methionine.

Three peanut cultivars (Early Bunch, Florunner and NC-FLA 14) were grown in two replicate experimental plots in Tifton, Georgia during the 1978 season. Urea was applied at 0, 10, 20, and 40 lb N/ac. Urea increased the total yield of all three cultivars, however, the higher rates of applications had a negative effect on yield. Methionine concentration increased slightly at 10 lb/ac only. No differences have been noted in oil content, protein, and characteristic protein profile of the seeds as determined by Polyacrylamide Gel Electrophoresis.

Effect of a Cytokinin Containing Plant Extract, Cytex, on Peanut Reproduction.
D. L. Ketring, USDA-SEA, Agronomy Dept., Oklahoma State University, and
A. M. Schubert, TAES, Texas A&M University, Plant Disease Research Station, Yoakum.

Cytokinins are one of the major classes of plant hormones that regulate plant growth and development. They promote cell division, delay leaf senescence, maintain protein and chlorophyll levels in detached leaves, and affect plant metabolism. Cytokinin activity is high during early stages of fruit and seed development. Thus, they offer a possible means to enhance reproduction of peanuts. Cytex is a water soluble plant (marine algae) extract containing about 100 ppm kinetin equivalents by bioassay. Cytex was applied at Treatment-Rates of 0.94, 1.27, 1.88, and 3.76 ml of formulation per m^2. Treatment-Times were: (1) early flowering stage (35-40 days after planting); (2) late flowering-pegging stage (59-61 days after planting); and (3) both stages (1) and (2). In 1976, 1.27 ml Cytex/m^2 was applied to 'Florunner', 'Starr', and 'Tamnut 74' at all Treatment-Times. Some treatments tended to be higher than the check, but there were no significant differences in yield (kg pod/ha) or value ($/metric ton). In 1977, a significant increase in yield of Tamnut 74 occurred at the 3.76 ml Cytex/m^2 rate applied at Treatment-Time (3). In this test the plants were sprinkler irrigated about 24 hr after spraying. In 1978, this procedure was used to test three rates (0.94, 1.88, and 3.76 ml Cytex/m^2) on reproduction of Florunner and Tamnut 74. There were no significant differences between treatments and check for yield, grade, and value of the peanuts produced. Thus far, we have been unable to obtain consistent and significant effects on reproduction of peanuts with sprays of Cytex.

Three Year Effects of Herbicide Treatments Upon Yellow Nutsedge Populations in Peanuts. W. J. Grichar, T. E. Boswell, and M. G. Merkle. Texas Agricultural Experiment Station, Texas A&M University, Yoakum, Texas and College Station, Texas.

Field experiments were conducted in South Texas for the control of yellow nutsedge (Cyperus esculentus) on peanuts with selected preland preparation (plp), preplant incorporation (ppi) and post-emergence (poe) treatments and various combinations. Seasonal and cumulative treatment effects upon nutsedge populations were evaluated for three consecutive years on permanently identified plots.

Plp treatments of glyphosate at 1.68 and 3.36 kg ai per hectare (1.5 and 3.0 lbs per acre) gave seasonal control which varied from 49 to 97%. However, nutsedge ratings, as indicated by emerged plants in early spring, following the third year of treatment showed that 1.68 and 3.36 kg ai per ha rate of glyphosate gave residual control of 97 and 94% respectively.

Seasonal control with vernolate alone applied ppi at 2.8 kg ai per ha (2.5 lbs per acre) varied from 43 to 73%. Vernolate ppi in combination with either glyphosate plp or bentazon poe gave significantly better season long nutsedge control than the vernolate treatment alone. Bentazon applied poe at 1.68 kg ai/ha gave ratings which ranged from 89 to 96%. These combination treatments increased nutsedge control by 20-40% above the vernolate alone.

Differentiation of Yellow and Purple Nutsedge. C. W. Swann and C. M. French, University of Georgia.

Yellow nutsedge (Cyperus esculentus L.) and purple nutsedge (Cyperus rotundus L.) are serious problem weeds in peanut production in the United States and throughout the world. Until recently it has not been necessary that growers distinguish between the two species since control procedures including both herbicides and cultural practices have been equally effective in control of both species. Bentazon, a new postemergence herbicide for peanuts and other crops, which is effective in controlling yellow nutsedge but not purple nutsedge has made it necessary that growers be able to readily distinguish between the two species.

Morphological characteristics traditionally used to differentiate between yellow and purple nutsedge include flower color and variations of rhizome and tuber development and form. These characteristics are largely unsatisfactory since bentazon application should be made before the characteristics are well developed. Variation of leaf tip characteristics have proven to be a reliable key to separation of these two species in Georgia. The leaf tip of purple nutsedge is rather blunt (like the bow of a boat) while those of yellow nutsedge are needle-like with a slight constriction about 1.5 to 2.0 cm back from the tip.

Germination and Emergence of Florida Beggarweed and Its Competition with Peanuts. W. L. Currey and J. R. Hoopper, University of Florida, Gainesville, Florida.

Germination of Florida beggarweed (Desmodium tortuosum (SW) DC) seeds occurred between 21.5 and 44.0 C and was maximum between 24.2 and 44.0 C. At Gainesville, Florida, field emergence of seedlings occurred on or before April 11 and March 20 in 1976 and 1977, respectively. Peak emergence coincided with the recommended planting dates for peanuts. Emergence was earlier from tilled soil than from a non-tilled soil.

For periods of 0, 3, 6, and 9 weeks after emergence, peanuts ('Florunner') were maintained free of Florida beggarweed. Weed densities were maintained at approximately 1, 2, 4, and 8 weeds m^{-2}. Florida beggarweed plants which emerged in the peanut rows 3 or more weeks after peanut emergence were not significantly competitive. Peanut yield reductions were more strongly correlated with weed stem density ($r=-.84$) than weed dry weight ($r=-.76$) or LAI ($r=-.64$). The response was essentially linear. One Florida beggarweed stem m^{-2} reduced shelled peanut yields by 8.5 g m^{-2}. Increasing weed weight and population decreased percentage of large peanut seed and increased percentage of small and medium sized seed.

Peanut Response to Timing and Duration of Drought Stress as Reflected in Kernel Yield and Quality. J. R. Stansell and J. E. Pallas, Jr. Coastal Plain Experiment Station, University of Georgia and Southern Piedmont Conservation Research Center, USDA.

Drought is known to adversely affect peanut yield and quality, but very little is known regarding the most drought sensitive periods of the peanuts. This paper reports results of drought stress on peanuts at different ages. Dry conditions as desired, were established by rainfall controlled shelters.

Florunner peanuts were subjected to drought stress periods of 35 days duration at ages 36-70, 71-105 and 106-140 days. In additions, 70 day droughts were imposed at 36-105 and 71-140 days of age. Yield and quality responses were compared to peanuts grown with adequate water throughout the season.

Pod yields from all treatments were significantly different from each other, ranging from 5165 Kg/ha for the no drought treatment to 1387 Kg/ha for the 36-105 day drought treatment. As indicated by pod yield, the 35 day drought spanning the age bracket of 71-105 days was more damaging than 35 day droughts at 36-70 or 106-140 days of age.

The 70 day drought beginning at 36 days of age reduced SMK percentage to only 34% while pods from the 70 day drought treatment starting at 71 days of age graded 69% SMK. Percent SMK from the 106-140 day drought treatment was 78% and not significantly different from the no drought treatment.

Percent other kernels (immature, shrivels, etc.) were increased by drought from 36-105 days but not by drought from 71-140 days.

The Effect of Planting Time on Yield and Grade of Two Valencia Peanut Varieties in Portales, New Mexico. D. C. H. Hsi. New Mexico State University, Middle Rio Grande Branch Station, Los Lunas, NM 87031.

Date of planting tests were conducted at two locations near Portales in 1978. Both tests involved two varieties, NM Valencia A and NM Valencia C, and five planting dates, starting last week of April and continuing at weekly intervals whenever possible. All the date plantings emerged to good stand, grew well and were harvested on the same day (October 11).

At Location 1, no differences in yield and grade existed between the five planting dates. On averaging all dates, NM Valencia C yielded significantly higher than NM Valencia A. The two varieties also differed significantly in 100 seed weight, and in proportions of 1-, 2-, 3- and 4- seeded pods.

At Location 2, yield differences between the five planting dates were not significant at the five percent level. Average weight of 100 seed from the April 25 or the earliest planting date was significantly higher than that of all the other planting dates. On averaging all dates, NM Valencia C had higher shelling percentage, heavier seed weight and lower proportion of 4-seeded pods than NM Valencia A.

Nutrients Effects on Sclerotinia Blight Disease in Peanuts. D. L. Hallock and D. M. Porter. VPI & SU and USDA, SEA, Tidewater Research and Continuing Education Center, Suffolk, VA.

Ten plant nutrients were applied to peanuts (variety Florigiant) growing in a field severly infected with Sclerotinia sclerotiorum, causal agent of Sclerotinia blight, to determine the relationship between nutrients and disease development. $Zn(SO_4)$ sprayed on foliage four times at 1.12 kg/ha Zn/application was the most effective treatment suppressing disease symptoms by 75 to 80% and increasing yields by 1,960 kg/ha. $Cu(SO_4)$ applied similarly was the second most effective treatment. Both $Zn(SO_4)$ and $Cu(SO_4)$ caused moderate phytotoxicity. Soil applications of Zn or Cu were much less effective in reducing disease. $Fe(SO_4)$ sprayed similarly as the Zn suppressed disease considerably. Lime which changed soil pH from 5.3 to 6.5 suppressed the disease as the season progressed. Triple superphosphate (1,120 kg/ha) and flowable S reduced disease incidence slightly. Also disease symptoms were slightly less severe where B, or $Mg(SO_4)$ or $Mn(SO_4)$ were applied. K and $N(NO_3)$ were ineffective, although somewhat less Sclerotinia blight infection occurred where urea was applied; particularly when in combination with Nitrapyrin. Landplaster at rates up to 3,360 kg/ha did not suppress Sclerotinia blight.

Factors Affecting Peanut Yields in South and Central Texas. D. S. Moore and C. E. Hoelscher. Texas Agricultural Extension Service, Comanche and Stephenville, Texas.

Peanut production in Texas is centered around two major production regions—South and Central. Each area can be characterized by its own production practices and yields.

In Central Texas or the West Cross Timbers region, changes in peanut production occurred in two distinct stages. The first are those years prior to 1965 where five-year averages fluctuated between 348 lbs. to 764 lbs. of peanuts produced per acre. Then in 1966, yields increased to around 1300 lbs. per acre and appear to have stabilized at that level. In contrast, peanut production in South Texas can be characterized in three stages. Prior to 1960, yields averaged around 850 lbs. per acre. From 1961-65, there seemed to be a transition period where yields jumped to approximately 2000 lbs. of peanuts produced per acre. Then in 1966, there was another significant increase of around 600 lbs. to the present production level of 2500 to 2800 lbs.

Rainfall is actually less in South Texas than it is in Central Texas, but yields have been historically almost double. Irrigation played the major role in the substantial increase in yields of the Central region in 1965. It also affected yields in the Southern region, but better management practices such as crop rotation and pesticide use must be considered when comparing the two peanut production regions.

Resistance of NC 6 Peanut Cultivar to *Heliothis zea*. W. V. Campbell and J. C. Wynne. North Carolina State University, Raleigh.

'NC 6' (NC-GP 343 X Va. 61 R) was developed in North Carolina specifically for resistance to the southern corn rootworm. NC 6, however, possesses multiple insect resistance with lower levels of resistance to thrips (Frankliniella fusca), the potato leafhopper (Empoasca fabae) and the corn earworm (Heliothis zea).

Natural field infestations of the corn earworm were high in 1977. In one test NC 6 exhibited approximately one-third as much foliage loss from the corn earworm as 'NC 2' or 'Florigiant.' NC 6 showed less corn earworm damage than 48 plant introductions and commercial cultivars. Similar results were obtained in field tests in 1978. NC 6 had only 1% corn earworm damage while NC 2 and Florigiant had 7.3% and 12.3%, respectively.

NC 2, Florigiant, and NC 6 were evaluated in the laboratory for corn earworm larval feeding preference. Where larvae had a choice they preferred NC 2 and Florigiant to NC 6.

Larval antibiosis was identified as a mechanism of resistance of NC 6 to the corn earworm. Larvae reared on Florigiant weighed 3 times more than larvae reared on NC 6 in one test and 5 times more in another test. While larval antibiosis is a mechanism of resistance of NC 6 to the earworm, adult oviposition-al nonpreference has not been determined.

Aspects of Biology and Control of the 3-Cornered Alfalfa Hopper *Spissistilus Festinus* (Say) in Peanuts. J. W. Todd, L. W. Morgan and G. J. Musick. Coastal Plain Experiment Station, University of Georgia, Tifton 31794.

The 3-cornered alfalfa hopper is a relatively new insect pest of peanuts in Georgia. This insect is endemic to the southern half of the United States, and feeds on a large number of different plant species. It overwinters in this locality in both adult and nymphal stage. During winter, feeding occurs on small grains, legumes, especially arrowleaf clover and winter weeds, e.g. Geranium, Oneothera, Lepidium, Rumex, Sida and several grasses. When peanuts begin growing in the spring, the adults may transfer to this crop. Feeding by adults and nymphs in a circular fashion around the stems and leaf petioles girdles these parts and may cause them to die or break off during periods of drought stress.

In 1978 investigations on the basic biology, damage potential, and control of the 3-cornered alfalfa hopper were initiated. Observations were made on alternate hosts and population dynamics of the species prior to the movement into the peanut crop. On July 1, a cage experiment in which 1/3, 1 and 2 adults/ft of row were confined in lumite cages over peanuts to assess the extent of damage by these population densities. One series of these caged adults was sprayed to eliminate the adult population after 1 week of confinement. The other series was permitted to remain until the peanuts were harvested. At harvest, plants were evaluated for stem damage and subsequent effects on yield. In addition to the above study, 5 plants/plot in several other experiments on chemical control were examined for girdles.

Laboratory Life History of a Burrowing Bug, Pangaeus bilineatus (Say). Leeda A. Thompson and J. W. Smith, Jr. Texas A&M University, College Station Texas 77843.

Forty-one pairs of an adult burrowing bug, Pangaeus bilineatus (Say) were observed, 1 pair/container, at 27°C in the laboratory to delineate several aspects of its life history. The life span of males averaged 86 days, compared to 73 days for females. Females laid an average of 303 eggs over a period of 63 days, a rate of 5 eggs/day, after a preovipositional period of 9 days. These data are presented in different forms to illustrate the temporal distribution of oviposition, fertility budgets, and life tables.

Effects of Temperature on the Population Dynamics of Laboratory Reared Lesser Cornstalk Borers, *Elasmopalpus lignosellus* (Zeller). Harry L. Carrola. Texas A&M University, College Station, Texas 77843, and Rodney Sams. Texas Agricultural Experiment Station, Stephenville, Texas 76401.

The lesser cornstalk borer (LCB) was exposed to a series of temperatures ranging from 65 to 95°F. Several population parameters were measured to determine the effects of temperature. Generation time (T) for the LCB decreased with increasing temperatures and the corresponding rate of development (1/T) exhibited a positive linear relationship with time. Fecundity and fertility were also measured; their relationship is best described by a bell-shaped curve, with the largest number of eggs oviposited at 85°F. The number of eggs oviposited decreased at the upper and lower regions of the temperature range. Natality also exhibited a bell-shaped curve with the greatest number of eggs hatching at 85°F. Adult LCB survival was greatest at 80°F and lowest at 70 and 95°F.

A New Virus of the Lesser Cornstalk Borer. Forrest L. Mitchell and J. W. Smith, Jr. Texas A&M University, College Station, Texas 77843.

A recently discovered entomopox virus which attacks the larvae of the lesser cornstalk borer, Elasmopalpus lignosellus (Zeller), is occluded in a crystalline protein body visible under the light microscope. The virus is found in the cytoplasm of cells of several internal organs. Gross symptoms of infection include general body swelling, a color change in the hemolymph and a color change in the larva. Upon death, the cadaver blackens and dissolves, serving as a source of innoculum. As the lesser cornstalk borer larvae is difficult to control with conventional insecticides, the virulence and possible benefits of this microbial agent in a pest management program are discussed.

Population Dynamics and Natural Mortality of Several *Geocoris spp.* in the Peanut Agroecosystem. David L. Davis, Jr. Texas A&M University, College Station, Texas 77843.

Four species of Geocoris have been observed over a two year period in several peanut fields located in the West Cross Timber area of Texas. Preliminary monitoring of population dynamics of all life stages during the peanut growing season indicate Geocoris pallens to be the dominate species during this temporal period. Geocoris punctipes tends to increase in abundance and displaces G. pallens as the dominate species in early fall. Geocoris lividipennis and G. uliginosus populations remained extremely low throughout the summer and tended to be infrequently encountered. Several natural enemies, in combination with intraspecific predation, have been identified as biotic mortality factors affecting population dynamics of the Geocoris spp. complex. A Telenomus sp. has been isolated from egg samples and a tachnid parasite has been reared from adults. Predation by a wide variety of spiders supplements intraspecific predation of the nymphal and adult life stages.

Biology, Distribution, Host Plants and Chemical Control of the 2-Spotted Spider Mite Tetranychus urticae Koch on Peanuts in Georgia. Loy W. Morgan. Coastal Plain Experiment Station, University of Georgia, Tifton.

Spider mite infestations of peanuts in Georgia usually develop when rainfall is light in May and June, and if well established at this time continue to persist even if there is adequate rainfall in July and August.

The spider mite infestations usually originate at a location in the field which adjoins an untended ditch bank, fence row, undisturbed terrace or roadway. The infested area of peanuts may remain relatively small for several weeks and them begin spreading rapidly into the field in the direction of prevailing winds. The small areas of initial infestation may become severely injured, resulting in complete plant defoliation. When this condition develops, mites in these areas cover the plants with layers of silk, particularly the highest point of vegetation in the infested area. Large numbers of mites move to the top of these silk-covered areas and launch themselves into the air when there is discernible air movement. During these periods of dispersion, the mites become very active and may form masses several layers deep. Some of the individuals spin threads of silk, which apparently assist them in becoming airborne.

Florida beggarweed Desmodium purpurea (Mil.), a serious weed pest in peanut fields, is also a favorite host of the 2-spotted spider mite. When beggarweeds are not removed from infested fields they also become mite-infested, and as they stand 1-3 feet above the peanut foliage, are a factor in mite dispersal.

Report of the

PEANUT BREEDING WORK GROUP

Meeting during the 11th Annual Conference of the
AMERICAN PEANUT RESEARCH AND EDUCATION ASSOCIATION, INC.,

Chairman, Ray O. Hammons

The Peanut Breeding Work Group held discussions on two major topics in sessions totalling 3 hours. Thirty-two individuals participated in the sessions.

Session I. Breeding for Leafspot Resistance in Peanuts. Discussion Leaders: A. J. Norden, C. E. Simpson, Dan Gorbet. Panelists: Bill Branch, Ray Hammons, D. McDonald.

Session II. Utilizing Arachis Species in Breeding. Discussion Leaders: C. E. Simpson, D. J. Banks. Panelists: Phil Moss, Ton Stalker.

Bill Branch was the ad hoc recorder.

The Work Group plans to meet next year as part of the A.P.R.E.S. annual meeting in Richmond. J. C. Wynne and T. A. Coffelt were selected as program coordinators.

Report submitted by: Ray O. Hammons

APREA BOARD OF DIRECTORS MEETING

Camelot Inn, Tulsa, Oklahoma

10 July 1979

The meeting was called to order by President A. J. Norden at 8:10 P.M. The following board members were present: A. H. Allison, Wayne Eaves, James S. Kirby, John Martin, A. J. Norden, Robert Ory, Wilbur Parker, Astor Perry, Dennis Robbins (representing Lewie Helms), and Don Smith. Other participants were: Don Banks, J. L. Butler, Dan Hallock, Darold Ketring, Harold Pattee, Russell Schools, Joe Sugg and C. T. Young.

A. H. Allison moved that the minutes of the APREA Board of Directors Meetings in Gainesville, Florida on 11 and 13 July 1978 be approved as published on pages 85-88 of Volume 10 of APREA PROCEEDINGS. Motion seconded by Astor Perry. Motion passed.

Dan Hallock reported on the revision of PEANUTS-CULTURE AND USES. A. H. Allison moved that the report be accepted. Seconded by Astor Perry. Motion passed. The complete report is published in this volume.

Darold Ketring reported on the status of PEANUT RESEARCH. Robert Ory moved that the report be accepted. Seconded by Wayne Eaves. Motion passed. The complete report is published in this volume.

A. H. Allison reported that the 1980 annual meeting will be held at the Hyatt House of Richmond, Virginia from 15-18 July 1980. Rates of $42.00 for singles and $52.00 for doubles have been confirmed. A. H. Allison moved that the site selection report be accepted. Seconded by Robert Ory. Motion passed.

Robert Ory moved that a standing site selection committee with at least six members, each with terms of three years, be appointed to select meeting sites three years in advance of annual meetings. Each year two members of the committee rotate off the committee and two new members are appointed. Motion seconded by James S. Kirby. Motion passed.

Harold Pattee presented the report of the Ad Hoc Committee on the Tax Status of APREA, and explained the financial advantages which will result if a change from a classification of 501-C6 to 501-C3 is effected. The resolution which was approved by the Board of Directors is published as a part of the minutes of the regular business meeting on 13 July 1979.

Ray Hammons reported on PEANUT RESEARCH; Harold Pattee reported on PEANUT SCIENCE. A. H. Allison moved that these reports be accepted. Seconded by Wilbur Parker. Motion passed. These reports will appear in this volume.

A. H. Allison reported on the activities of the Public Relations Committee. Robert Ory moved that the report be accepted. Seconded by Wayne Eaves. Motion passed. The report will be published in this volume.

Clyde T. Young presented the report of the Peanut Quality Committee. J. S. Kirby moved that the report be accepted. Seconded by Robert Ory. Motion passed. This report appears in this volume.

Astor Perry presented the report of the Nominating Committee. Robert Ory moved that the report be accepted. Seconded by Wilbur Parker. Motion passed. This report is published in this volume.

John Martin, President of the National Peanut Council, invited APREA to participate in the selection of nominees for the Golden Peanut Research Award. Robert Ory moved that the name of the Bailey Award Committee be changed to the Awards Committee and that this committee work with the National Peanut Council. Seconded by Astor Perry. Motion passed.

Astor Perry moved that the meeting be adjourned. Seconded by Robert Ory. Motion passed. The meeting was adjourned at 10:45 P.M.

APREA BOARD OF DIRECTORS MEETING

Camelot Inn, Tulsa, Oklahoma

12 July 1979

The meeting was called to order by President A. J. Norden at 8:00 P.M. The following board members were present: A. H. Allison, Wayne Eaves, James S. Kirby, A. J. Norden, Robert Ory, Astor Perry, and Don Smith. Other participants were: Ray Hammons, Harold Pattee, Olin Smith, Russell Schools, and Roy V. Sturgeon.

After a request by Roy V. Sturgeon, representative of the Extension-Industry Peanut Disease Discussion Group, Astor Perry moved that the programs of special interest group meetings be printed in the general APREA program and that a record of these meetings be published in the proceedings of the meeting. Seconded by Wayne Eaves. Motion passed.

Jim Kirby moved that the Extension-Industry Peanut Disease Discussion Group be authorized to use APREA letterhead, and that the Executive Secretary-Treasurer of APREA be provided with copies of all correspondence distributed on this letterhead. Seconded by Robert Ory.

Russell Schools presented the report of the Finance Committee. This complete report is published in this volume.

By consensus it was agreed that one gratis copy of PEANUTS-CULTURE AND USES will be provided for each of the co-editors (Harold Pattee and Clyde Young) who are involved in the revision of the book.

President Norden reported that the liaison report of APREA to the American Society of Agronomy will be published in the proceedings. Ray Hammons is the author of this report.

Robert Ory moved that a late membership renewal penalty of three dollars per member be established on 31 July 1980. Seconded by James S. Kirby. Motion passed.

A. H. Allison moved that the officers of APREA be authorized to pay legal fees incurred in attempting to change the tax status of APREA from 501-C6 to 501-C3. Seconded by Robert Ory. Motion passed.

The meeting was adjourned at 9:15 P.M.

Minutes of the Regular Business Meeting of the

AMERICAN PEANUT RESEARCH AND EDUCATION ASSOCIATION

Camelot Inn, Tulsa, Oklahoma, July 13, 1979

The meeting was called to order by President A. J. Norden at 7:30 A.M.

The invocation was given by Ron Henning.

J. S. Kirby, Chairman of the Program Committee, thanked the members of the Technical Program Committee and the Local Arrangements Committee. In addition, he thanked the various companies who contributed materially to the eleventh annual meeting of APREA.

President Norden presented his report, and the complete report is published in this volume of APREA PROCEEDINGS.

The Bailey Award was presented in absentia to David A. Nickle and D. W. Hagstrum for their paper entitled "Provisioning with Pre-Paralyzed Hosts to Improve Parasite Effectiveness: A Pest Management Strategy for Stored Commodities."

Robert Ory moved that the minutes of the Regular Business Meeting of the American Peanut Research and Education Association in Gainesville, Florida on July 14, 1978 be approved as published on page 89 of APREA PROCEEDINGS (Volume 10). Seconded by Olin Smith. Motion passed.

The APREA Finance Committee Report was presented by Russell Schools. Russell Schools moved that the report be adopted. Seconded by James Butler. Motion passed. The Finance Committee report is published in this volume.

The report of the Publications and Editorial Committee was presented by Olin Smith. Ray Hammons reported on PEANUT RESEARCH, and Harold Pattee reported on PEANUT SCIENCE. The report of this committee is published in this volume. Robert Ory moved that the report be accepted. Seconded by Ray Hammons. Motion passed.

Clyde Young presented the report of the Peanut Quality Committee. Clyde Young moved that the report be accepted. Seconded by Robert Ory. Motion passed. The complete report is published in this volume.

D. L. Hallock, Chairman of the Ad Hoc Committee on Revision of PEANUTS-CULTURE AND USES, presented the report and moved that the report be accepted and that the book be revised. Seconded by Robert Pettit. Motion passed. The complete report is published in this volume.

Darold Ketring reported on the status of PEANUT RESEARCH, and he moved that the report be accepted. Motion seconded by Don Banks. Motion passed.

Harold Pattee, Chairman of the Ad Hoc Committee on the Tax Status of APREA, moved that the following resolution be adopted. The motion was seconded by J. L. Butler.

> WHEREAS the corporation was organized as a non-profit corporation under the laws of the State of Georgia on October 26, 1968, and

WHEREAS since the date of incorporation, the operation and activities of the corporation have evolved into and are now limited to the activities of an educational, scientific organization as described in Section 501 (c) (3) of the Internal Revenue Code, and

WHEREAS it appears in the best interest of the corporation to amend its charter to conform to the limited nature of its purposes and activities,

NOW, THEREFORE, BE IT RESOLVED that Article 1 of the Articles of Incorporation be amended to change the name and style of the corporation to AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY, INC.,

FURTHER RESOLVED that Article 2 of the Articles of Incorporation be amended to reflect the object and purpose of the corporation to be as follows:

(a) To instruct and educate the public on the properties, production, and use of the peanut through the organization and promotion of public discussion groups, forums, lectures, and other programs or presentations to the interested public.

(b) To promote scientific research on the properties, production, and use of the peanut by providing forums, treatises, magazines, and other forms of educational material for the publication of scientific information and research papers on the peanut and the dissemination of such information to the interested public.

(c) This corporation is organized and shall be operated exclusively for educational and scientific purposes, and not for profit. This corporation shall engage in no activity prohibited for organizations described in Section 501(C) (3) of the Internal Revenue Code of 1954, as amended. No part of the earnings of this corporation or the funds contributed by any person or corporation shall inure to the benefit of any officer or director of the corporation or any private individual, except that reasonable compensation may be paid for the corporation affecting one or more of its purposes. In the event of the liquidation or dissolution of the corporation, whether voluntary or involuntary, no officer or director of the corporation or any private individual shall be entitled to any distribution or division of its remaining property or its proceeds, and the balance of all money and other property received by the corporation from any source, after the payment of all debts and obligations of the corporation, shall be transferred to an organization whose purposes are similar to those of this organization or to some other educational, scientific organization as shall be selected by the Board of Directors, provided such organization is exempt from Federal income tax under the provisions of Section 501(c) (3) of the Internal Revenue Code of 1954, as amended. No substantial part of the activities of the corporation shall be carrying on of propaganda, or otherwise attempting to influence legislation, and the corporation shall not participate in or intervene in (including the publication or distribution of statements) any political campaign on behalf of any candidate for public office.

FURTHER RESOLVED that the Articles of Incorporation be amended by adding a new Article 8 as follows:

-8-

> The By-Laws of the corporation may be amended consistent with the provisions of these Articles of Incorporation by a two-thirds vote of all the members of the Board of Directors at any regular or special meeting, provided such amendments shall be submitted in writing to each member of the Board of Directors at least thirty days before the meeting at which the action is to be taken.
>
> The By-Laws or amendments to the By-Laws shall take effect immediately upon their adoption by the Board of Directors, except that the Board of Directors may establish a transition schedule when it considers that the changes may best be effected over a period of time. The amendments and transition schedules, if any, shall be published in the "Proceedings of APRES".

FURTHER RESOLVED that the Board of Directors are hereby directed to amend the By-Laws of the corporation in conformity with the amendments to the Articles of Incorporation as contained herein, together with such other amendments as it deems appropriate and necessary.

Olin Smith moved that the proposed Article 8 of the resolution be amended as follows: The By-Laws of the corporation may be amended consistent with the provisions of these Articles of Incorporation by a two-thirds vote of all eligible voting members present at any regular business meeting, provided such amendments shall be submitted in writing to each member of the Board of Directors at least thirty days before the meeting at which the action is to be taken.

The By-Laws or amendments to the By-Laws shall take effect immediately upon their adoption, except that the Board of Directors may establish a transition schedule when it considers that the changes may best be effected over a period of time. The amendments and transition schedules, if any, shall be published in the "Proceedings of APRES". The motion was seconded by Paul Blankenship and passed by a vote of 52 to 8.

Timothy Sanders moved that the resolution proposed by Harold Pattee and amended by Olin Smith be approved. Seconded by Robert Ory. Motion passed by a vote of 51 to 5.

Don Smith reported that the National Peanut Council has asked APREA to assist with the selection of the Golden Peanut Research Award Nominees, and that this has been approved by the APREA Board of Directors. In addition, Don Smith reported that a late dues renewal fee of three dollars per member has been approved by the Board of Directors, and it will be come effective on July 31, 1980.

Astor Perry presented the report of the nominating committee, and moved that it be accepted. Seconded by Ruth A. Taber. The report of the nominating committee appears in this volume.

President Norden presented the Past President's Award Certificate to Astor Perry.

Harold Pattee moved that the By-Laws be amended to conform to the previous resolution, as amended by Olin Smith. Seconded by David Hsi. Motion passed.

President A. J. Norden introduced James S. Kirby as the new President of APREA for 1979-1980.

C. E. Simpson moved that the meeting be adjourned. Seconded by Harold Pattee. The meeting was adjourned at 10:18 A.M.

PRESIDENT'S REPORT

A. J. Norden

The backbone of the president of an organization is his officers and his committees. The experience and knowledge of our Executive Secretary-Treasurer, Dr. Don Smith, in handling the many details of the organization has meant much to me, as it will also to our incoming president. Dr. Smith provides that continuity which is very important to progress toward fulfilling the goals of the association. Don and his wife deserve our sincere appreciation. The organization has grown and progressed to the point where we need to ease the work load of the Executive Secretary-Treasurer by providing him with some permanent assistance.

The committees which have been doing the heavy work of this organization during the past year will soon be presenting their reports to you for your information and action. Your Board of Directors has already screened the committee reports and taken official action as deemed appropriate. You will note as the reports are presented that the committees have worked hard and accomplished much.

The importance of having more continuity in our committee work was emphasized in the 1976 President's Report by Frank McGill who requested that committees name a vice chairman so that this person will know a year in advance that he will assume chairmanship. Since I failed to note his suggestion sufficiently early in my tenure as president I am relaying this good advice on to the incoming officers and committee chairman. Another point I would like to re-emphasize was one made by Leland Tripp in the 1977 President's Report in which he urged utilizing more of the newer members to serve in various capacities in the organization. You may have noticed in the 1978 Proceedings that the terms of committee service for many members will be expiring this year which means that my successor will be welcoming volunteers for various committee appointments.

The Board of Directors requested that your President appoint four different ad hoc committees to accomplish the following:

1st An ad hoc committee to study the revision of the book "Peanuts Culture and Uses". This committee, consisting of D. L. Hallock-Chr., D. J. Banks, Gale Buchanan, D. H. Smith, T. B. Whitaker and R. J. Henning was charged with the difficult tasks of determining the objectives and purpose of the book, the readers to whom it will be directed, chapter topics and suggested authors, length or number of pages per chapter and total for the book, number of copies to print, nomenclature to use, selection of the editor(s), and finally to propose a time schedule.

2nd An ad hoc committee to review the status of the APREA publication PEANUT RESEARCH. This committee consisting of Darold Ketring-Chr., R. E. Worthington, Johnny Wynne, John C. French, and D. W. Dickson was charged with determining whether the publication is fulfilling its purpose and if there are ways of improving it so that it might even better serve the membership.

3rd An ad hoc committee to study the APREA tax status and recommend changes that would permit the organization to receive a more favorable Internal Revenue Service classification that would allow mailing at reduced postage rates. This committee, consisting of H. E. Pattee-Chr., Joe S. Sugg and Astor Perry worked in conjunction with an ad hoc committee appointed by President Frank McGill in 1976 to study ways of amending the By-Laws in order to facilitate less cumbersome operation of the Organization.

The By-Laws committee consisted of J. L. Butler-Chr., B. L. Jones J. S. Kirby, W. T. Mills and D. M. Porter. Much effort was expended by these two committees during the year. Their joint report, which you will receive shortly, providing resolutions for amending the Articles of Incorporation and the By-Laws of APREA was approved unanimously by your Board of Directors.

4th An ad hoc committee to select the site for the Annual Meeting of APREA two years in advance. Based on a tradition of the organization to rotate the annual meetings among the three major peanut producing areas of the United States this committee, comprised of K. H. Garren-Chr., Walton Mozingo, C. C. Brooks and A. H. Allison, was charged with recommending a site for the 1980 meetings somewhere in the Northeast area.

The appointment by Astor Perry in 1978 of Dr. R. O. Hammons as the APREA Liaison Representative to the American Society of Agronomy is providing advantages to both organizations by facilitating the scheduling of common interest meetings, collaborative programming and by keeping members informed of some of the other organizations' activities. It would be beneficial if more appointments of this kind could be made between APREA and other professional organizations, such as Entomology, Pathology, Weed Science, Engineering, Food Science, etc.

At the opening General Session on July 11, I mentioned that the membership had increased to an all-time high which is now in excess of 580 members and pointed out the increasing numbers of international participants. There are 22 foreign members representing 13 countries and all 6 continents registered at this meeting which reflects well on the organization.

Before completing this report I want to say a few words about "ENERGY". The world is on the threshold of change. The energy crisis is going to be affecting every facet of our lives. Agriculture is affected in that fuel, fertilizer, pesticides, and transport of products will be ever more costly. It is a challenge for us in the peanut community to work together to solve or lessen some of these problems. With peanuts we are fortunate in a way, when compared with many other crops. Being a legume, little if any nitrogen fertilizer is required, and soil nutrient and pH level are not as critical, nor is a lack of a regular supply of moisture quite as devastating as with many field crops. Also, peanuts are not very perishable and the crop may be trucked to market one week or the next without severe losses. The U. S. peanut crop at one time was dried almost entirely by solar energy but a return to the stack-pole method of drying would not be looked upon with pleasure.

Research must be oriented toward more energy efficient peanut production. This means, for example, that peanut breeders must give increased attention to selecting lines with better resistance to insects, diseases, nematodes and to lines better able to compete with weeds and withstand periods of drought-stress. Peanuts seem to be somewhat better adapted than most crops to produce at very reduced energy input levels. This is illustrated in India where peanuts are almost a no-energy input crop. However average peanut yields in India are only about one fifth as much as in the United States.

I want to close this report by thanking all of you for your cooperation during the past year, and to say I'm confident that, working together, we can meet the challenges ahead.

PROGRAM COMMITTEE REPORT

J.S. Kirby, Chairman

The printed program for the eleventh annual meeting of APREA is complete as given below except that organizations contributing to the overall enjoyment of our meeting need to be acknowledged. The following groups contributed in various ways to help host and sponsor this year's meeting and we are extremely appreciative of all they do for our industry throughout the year as well as their special efforts in helping make the APREA meeting a success.

Agricultural Industries
Chevron
Diamond Shamrock
Discoveryland
DuPont
Eli Lilly
Gandy Corporation
Lafortune Park
Monsanto Company
North American Plant Breeders
Oklahoma Peanut Commission
Oklahoma Peanut Growers Association
Oklahoma Wheat Commission
Olin Corporation
Sortex Company of North America, Inc.
Thompson-Hayward
Tulsa Metropolitan Chamber of Commerce
Uniroyal
U.S. Gypsum

Ladies' Program

Helen Wolfe, Chairman
Sally Banks
Shari Dunn
Beverly Ketring
Barbara Kirby
Sue Santelmann

Local Arrangements

Charles Dunn, Chairman
Pete Bloome
Jackie Coppedge
Kirby Cozort
Wayne Eaves
Bill Flanagan
Rhea Foraker
Harvey Jacks
Dee Keeton
Floyd King
Keith McLemore
Jay Murray
Harold Myers
Larry Phillips
Ken Pinkston
Angela Rudrof Rushing
Paul Santlemann
Roy Sturgeon
Bill Webb
Ross Wilson

Technical Program

Don Banks, Chairman
Dick Berbetet
Bob Clary
John Franzman
Darold Ketring
Hassan Melouk
Don Murray
George Odell
Don Peters
John Thomas
Leland Tripp
Dallas Wadsworth
George Waller
Bob Westerman

PROGRAM
for the
Eleventh Annual Meeting
of the
American Peanut Research and Education Society

Tuesday, July 10

8:30-5:00	Extension - Industry Peanut Disease Workers Seminar, Roy V. Sturgeon, Jr., Chairman - Jesters West
1:30-5:00	Peanut Breeding Workgroup, Ray O. Hammons, Chairman - Friar Tuck West
1:00-8:00	APRES Registration - Lobby
3:00-5:00	Committee meetings (open to all APRES members) Committees and meeting rooms will be posted at registration desk
8:00-10:00	Board of Directors Meeting - William Tell

Wednesday, July 11

8:00-5:00	Registration - Lobby
	Exhibits - Friar Tuck and Robin Hood East
GENERAL SESSION -	Al Norden, presiding - Jesters and Robin Hood West
8:30	APRES President's Welcome - Dr. Al Norden
8:35	Welcome from OSU - Dr. Jay Murray
8:40	Address by the Honorable Spencer Bernard, Lieutenant Governor, State of Oklahoma, and Peanut Grower
9:05	Welcome from Oklahoma Peanut Growers - Mr. Jack Coppedge
9:10	Address by Mr. Floyd King, Peanut Industry Representative on American Agriculture Council's Board of Directors
9:40	BREAK - Friar Tuck and Robin Hood East
10:15	Technical Program
GENERAL SESSION -	William Flanagan, presiding - Jesters and Robin Hood West
10:15	Effects of Row Spacing, Weed-free Maintenance Periods and Herbicide Systems on the Yield of Florunner Peanuts - E. W. Hauser, G. A. Buchanan, and J. W. Slaughter
10:30	Development of a Peanut Sheller for Laboratory and Industrial Applications - J. I. Davidson, Jr. and R. F. Hudgins
10:45	Net Photosynthetic Efficiency and Partitioning of Photosynthate in Peanut Cultivars - S. T. Ball, J. C. Wynne, and T. G. Isleib
11:00	Non-target Effects of the Insecticide Chlorpyrifos to Certain Soil-borne Peanut Pathogens - J. M. Hammond, P. A. Backman, and M. H. Bass
11:15	A Day in the Life of the Peanut - J. E. Pallas, Jr.
11:30	Discussion
LUNCH	

1:00	Two Concurrent Sessions
SESSION A	PLANT PATHOLOGY - Morris Porter, presiding - Jesters West
1:00	Reduction of Sporulation of Cercosporidium personatum by Hansfordia in Texas - R. A. Taber, R. E. Pettit, R. E. McGee, and D. H. Smith
1:15	CGA 64251 - A Promising New Fungicide for Control of Southern Blight and Cercospora Leafspot of Peanuts - B. L. Jones, D. H. Smith, and R. E. McGee
1:30	Effect of Fungicides, Applied Through Irrigation, on Fungal Populations in Soil - H. A. Melouk and R. V. Sturgeon, Jr.
1:45	Development of Cercosporidium personatum in Three Peanut Canopy Layers - J. L. Plaut and R. D. Berger
2:00	A Soil-borne Virus Disease of Peanuts in India - D. V. R. Reddy, N. Iizuka, P. Subrahmanyam, R. Rajeswari, and D. McDonald
2:15	Discussion
2:45	BREAK - Friar Tuck and Robin Hood East
SESSION A	MYCOTOXINS - Robert Pettit, presiding - Jesters West
3:15	Comparison of Pod and Seed Screening Methods on Aspergillus Colonization of Peanut Genotypes - A. C. Mixon
3:30	A Water Slurry Method of Extracting Aflatoxin From Peanuts - T. B. Whitaker, J. W. Dickens, and R. J. Monroe
3:45	Discussion
SESSION B	PROCESSING, UTILIZATION, CURING, AND STORING - Harold Pattee, presiding - Jesters East
1:00	Effects of Genotype, Digging Date and Grade on the Blanchability of Virginia Type Peanuts - R. W. Mozingo
1:15	Volatile Components of Roasted Peanuts: Varietal Comparisons of the Basic Fraction - G. R. Waller, A. Khettry, and C. T. Young
1:30	Evaluation of Free Amino Acid and Free Sugar Contents in Virginia Type Peanuts of Different Varieties and Planting Locations - C. Oupadissakoon, C. T. Young, and R. W. Mozingo
1:45	Desolventization of Hexane Extracted Peanut Meal - J. Pominski, H. M. Pearce, Jr., H. P. Dupuy, and J. J. Spadaro
2:00	Effects of Various Field Applications of Calcium, Magnesium and Potassium on the Quality of Peanuts for Salting - S. R. Cecil and M. E. Walker
2:15	Effect of Oven Drying Time on Peanut Moisture Determination - J. H. Young, T. B. Whitaker, P. D. Blankenship, G. H. Brusewitz, J. M. Troeger, J. L. Steele, and N. K. Person, Jr.
2:30	Five Precleaning Systems for Peanut Warehouses - P. D. Blankenship, J. I. Davidson, Jr., and J. W. Willis
2:45	BREAK - Friar Tuck and Robin Hood East
3:15	Open - Discussion groups to be arranged as needed (Mycotoxins papers and discussion - Jesters West)
6:00	Barbeque at Discoveryland Amphitheatre

Thursday, July 12

8:00-12:00	Registration - Lobby
	Exhibits - Friar Tuck and Robin Hood East
8:30	Two Concurrent Sessions
SESSION A	BREEDING AND GENETICS - Charles Simpson, presiding - Jesters West
8:30	Pod Rot Resistance: Germplasm Evaluation - T. E. Boswell, O. D. Smith, and B. L. Jones
8:45	Pod Rot Resistance: Line Selection and Evaluation - O. D. Smith and T. E. Boswell
9:00	Pod Rot Resistance: Structural Differences Among Tolerant and Susceptible Genotypes - R. E. Pettit, R. A. Taber, O. D. Smith, and T. E. Boswell
9:15	Inheritance of Testa Color Variegation in Arachis hypogaea L. - W. D. Branch and R. O. Hammons
9:30	Amino Acid Composition of Peanut (Arachis hypogaea L.) Samples from the 1973 and 1974 Uniform Peanut Performance Tests (UPPT) - C. T. Young
9:45	BREAK - Friar Tuck and Robin Hood East
SESSION A	BREEDING AND GENETICS - Ray Hammons, presiding - Jesters West
10:15	Wild Species in the Improvement of Groundnuts, I. Disease Reaction of Hexaploids - J. P. Moss, A. K. Singh, A. P. Burge, and S. Bradley
10:30	Interspecific Hybridization Between Cultivated and Wild Species - H. T. Stalker and J. C. Wynne
10:45	Genotype x Environment Interactions in the Testing of Peanut Lines for Oklahoma - K. E. Dashiell, J. S. Kirby, and R. W. McNew
11:00	Breeding for Earliness in Spanish Peanuts - D. J. Banks and J. S. Kirby
11:15	Discussion
LUNCH	
SESSION A	PHYSIOLOGY AND SEED TECHNOLOGY - Robert Roy, presiding - Jesters West
1:00	Seed Size, Weight, Length, Germination and Calcium Characteristics of Apical and Basal Seeds from Four Peanut Cultivars - G. A. Sullivan, A. Perry, S. K. Hube, A. Ali, and P. C. Dye
1:15	A Non-destructive Method of Peanut Pod Maturity Classification - J. S. Drexler and E. J. Williams
1:30	Maturative Changes in the Triacylglycerol Fraction of Peanut Oil - T. H. Sanders
1:45	Anatomical Differences of Functional and Non-functional Nodules of Peanuts (Arachis hypogaea L.) - J. S. Calahan, Jr.
2:00	Effects of Foliar Application of Urea on Peanut Yield and Seed Quality - S. K. Pancholy and A. L. Guy
2:15	Effect of a Cytokinin Containing Plant Extract, Cytex, on Peanut Reproduction - D. L. Ketring and A. M. Schubert
2:30	Discussion
2:45	BREAK - Friar Tuck and Robin Hood East

3:15-5:00	Open - Discussion groups to be arranged as needed
8:00	Board of Directors meeting - William Tell
SESSION B	WEEDS - Howard Greer, presiding - Jesters East
8:30	Three Year Effects of Herbicide Treatments Upon Yellow Nutsedge Populations in Peanuts - W. J. Grichar, T. E. Boswell, and M. G. Merkle
8:45	Differentiation of Yellow and Purple Nutsedge - C. W. Swann and C. M. French
9:00	Germination and Emergence of Florida Beggarweed and Its Competition with Peanuts - W. L. Currey and J. R. Hoopper
9:15	Discussion
9:45	BREAK - Friar Tuck and Robin Hood East
SESSION B	PRODUCTION AND TECHNOLOGY - Leland Tripp, presiding - Jesters East
10:15	Peanut Response to Timing and Duration of Drought Stress as Reflected in Kernel Yield and Quality - J. R. Stansell and J. E. Pallas, Jr.
10:30	The Effect of Planting Time on Yield and Grade of Two Valencia Peanut Varieties in Portales, New Mexico - D. C. H. Hsi
10:45	Nutrients Effects of Sclerotinia Blight Disease in Peanuts - D. L. Hallock and D. M. Porter
11:00	Factors Affecting Peanut Yields in South and Central Texas - D. S. Moore and D. E. Hoelscher
11:15	Discussion
LUNCH	
SESSION B	ENTOMOLOGY - Leonard Redlinger, presiding - Jesters East
1:00	Resistance of NC 6 Peanut Cultivar to *Heliothis zea* - W. V. Campbell and J. C. Wynne
1:15	Aspects of Biology and Control of the 3-Cornered Alfalfa Hopper *Spissistilus festinus* (Say) in Peanuts - J. W. Todd, L. W. Morgan, and G. J. Musick
1:30	Laboratory Life History of a Burrowing Bug, *Pangaeus bilineatus* (Say) - L. A. Thompson and J. W. Smith, Jr.
1:45	Effects of Temperature on the Population Dynamics of Laboratory Reared Lesser Cornstalk Borers, *Elasmopalpus lignosellus* (Zeller) - H. L. Carrola and R. Sams
2:00	A New Virus of the Lesser Cornstalk Borer - F. L. Mitchell and J. W. Smith, Jr.
2:15	Population Dynamics and Natural Mortality of Several *Geocoris* Spp. in the Peanut Agroecosystem - D. L. Davis, Jr.
2:30	Biology, Distribution, Host Plants, and Chemical Control of the 2-Spotted Spider Mite *Tetranychus urticae* Koch on Peanuts in Georgia - L. W. Morgan
2:45	BREAK - Friar Tuck and Robin Hood East
3:15-5:00	Open - Discussion groups to be arranged as needed
8:00	Board of Directors meeting - William Tell

Friday, July 13

7:30	Breakfast - Robin Hood and Jesters West
8:15	President's Address and business meeting - Robin Hood and Jesters West
10:00	Adjourn
8:00-12:00	Exhibit tear down - Friar Tuck and Robin Hood East

FINANCE COMMITTEE REPORT

Russell C. Schools, Chairman
Don Banks
Paul Blankenship

The finance committee met at 3:00 p.m. on July 11, 1979. Audits of the financial statements submitted by the Secretary-Treasurer and Peanut Science editor were conducted, and both were found to be in good order. The Bailey Award Fund was also reviewed and found to be in order. A copy of the Peanut Science financial statement is attached to this report and reflected in the Secretary-Treasurer's report.

The following recommendations were submitted by the Finance Committee and adopted by the Board of Directors:

1. That the assistant to the Secretary-Treasurer be paid $1,800 for the fiscal year July 1, 1979 to June 30, 1980.

2. That the salary of the Secretary to the Peanut Science Editor be increased from $1,400 to $1,500.

3. That the Secretary-Treasurer and the Peanut Science Editor be authorized to purchase a typewriter for each of their services. Authorized expenditures of approximately $1,000 each.

4. That the financial statement submitted by the Secretary-Treasurer and the Peanut Science Editor be accepted.

5. That the registration fee for the Association's meeting for members be increased from $10.00 to $15.00, and that the non-member registration fee be increased from $17.00 to $20.00.

6. That the proposed budget for July 1, 1979 to June 30, 1980, be adopted.

The finance committee commends the Secretary-Treasurer, the Peanut Science Editor, and others involved in the business affairs of the Association for an outstanding job.

AMERICAN PEANUT RESEARCH AND EDUCATION ASSOCIATION

Financial Statement

July 1, 1978 to June 30, 1979

ASSETS AND INCOME

I.

Item		
A.	Balance - July 1, 1978	$17,575.60
B.	Membership & Registration (Annual Meeting)	11,176.05
C.	Proceedings & Reprint Sales	411.22
D.	Special Contributions	150.00
E.	The Peanut	1,698.00
F.	Peanut Science Page Charges & Reprints	3,956.00
G.	Institutional Membership	855.00
H.	Differential Postage Assessment-Foreign Members	844.24
I.	Bailey Award	44.50
	Total	$36,710.61

LIABILITIES AND EXPENDITURES

II.

Item		
1.	Proceedings - Printing & Reprints	$3,462.32
2.	Annual Meeting - Printing, Catering & Misc.	1,730.66
3.	Secretarial	1,425.00
4.	Postage	410.84
5.	Office Supplies	264.22
6.	Position Bond for $5,000 (Exec. Sec. Treas.)	62.00
7.	Travel - President	-
8.	Travel - Executive Sec. Treas.	-
9.	Registration - State of Georgia	5.00
10.	Miscellaneous	231.21
11.	Peanut Science	10,000.00
12.	The Peanut	105.00
13.	Bank Charges	15.00
14.	Peanut Research	927.26
15.	Certificate of Deposit	10,000.00
16.	Membership	41.00
17.	Secretary - Self Employment Tax	269.51
	Total	$28,949.02

AMERICAN PEANUT RESEARCH AND EDUCATION ASSOCIATION

Financial Statement

July 1, 1978 to June 30, 1979

SAVING ACCOUNT

	Date	Interest	Disbursed	Balance
Yoakum National Bank Wallace K. Bailey Fund	6-30-79	$11.04	$44.50	$848.50

CERTIFICATES OF DEPOSIT

	Date	Balance
Yoakum Federal Savings & Loan Association	6-5-79	$11,125.80
Cuero Federal Savings & Loan Association	6-24-79	$10,453.41

AMERICAN PEANUT RESEARCH AND EDUCATION ASSOCIATION

Budget

July 1, 1979 to June 30, 1980

ASSETS AND INCOME

I

Item		
A.	Balance	$29,340.80
B.	Membership and REgistration	12,000.00
C.	Proceeding and Reprint Charges	400.00
D.	Peanut Science Page and Reprint Charges	11,090.00
E.	The Peanut - 35 copies @ $11.33	396.55
	TOTAL	$53,227.35

LIABILITIES AND EXPENDITURES

II

Item		
1.	Peanut Research	$ 1,250.00
2.	Proceedings, Printing, Etc.	4,500.00
3.	Annual Meeting	1,750.00
4.	Secretarial Services	1,800.00
5.	Postage	700.00
6.	Office Supplies (Two Typewriters)	2,600.00
7.	Travel - President	400.00
	Secretary-Treasurer	400.00
8.	Registration (State of Georgia)	5.00
9.	Peanut Science	11,075.00
10.	Miscellaneous	500.00
	TOTAL	$24,980.00
Reserve		28,247.35
	TOTAL	$53,227.35

REPORT OF THE PUBLICATIONS AND EDITORIAL COMMITTEE

by

Joe S. Sugg, Chairman

The activities of the Publications and Editorial Committee, in addition to the publication of RESEARCH, PEANUT SCIENCE, and the Proceedings, took on another aspect this year, in that the Editor of PEANUT SCIENCE, Harold Pattee, needed to get the by-laws amended in such a manner that our tax exempt status would be in effect and would permit us a monetary saving in the transaction of our business. These amendments were discussed with the Board at Tulsa prior to the annual membership meeting and, due to the fact that it was necessary for me to be absent on Friday at the annual membership meeting, Olin Smith handled my duties as Chairman of the Publications and Editorial Committee, with Ray Hammons giving an excellent report for RESEARCH, which is reproduced below:

> "Four issues of APREA PEANUT RESEARCH (Volume 15 No. 6/16 No. 1-Volume 16 No. 4, Issues 67-70 were compiled, edited, published and mailed to the membership during the year.
>
> "Circulation was to about 572 individual members or institutions in the U. S. and abroad.
>
> "PEANUT RESEARCH is sent to Libraries of Land-grant institutions in the Southern United States, to the USDA-SEA National Agricultural Library, to various abstracting services and to several agricultural periodicals.
>
> "All information issuances from APREA officers were published. 241 selected references and 34 theses or dissertations were documented."

Harold Pattee, Editor of PEANUT SCIENCE, gave a report (attached hereto) on the activities of PEANUT SCIENCE, and he handled the presentation of the amendments to the by-laws to the membership. The by-laws, as amended, will appear in the Proceedings of this session.

The Proceedings for 1978 were prepared and distributed to all members covering the activities of APREA's conference. Inasmuch as the by-laws were amended at the 1979 annual membership meeting which changes the name from the American Peanut Research and Education Association to the American Peanut Research and Education Society, and, in conformance with the legal requirements as dictated by our attorney, these Proceedings will be published for APRES.

PEANUT SCIENCE REPORT

The past year has again been a prosperous year for PEANUT SCIENCE. The number of manuscripts and pages printed were both at a new high. The number of authors, not APREA members, has also increased. The financial report for PEANUT SCIENCE has been given to the Finance Committee and will be included in their report. Status of the journal is as follows:

Manuscripts submitted July 1, 1978 - June 30, 1979...30

Total manuscripts printed.....28

Pages printed.....130

Cost per page including free reprints.....$59.76

Average length of article.....4.6 pages

Total cost per page.....$84.40

Editorial Board Members:

Term Expiring 1979	Area	Nominations
Thurman E. Boswell	Weed Science	Thurman E. Boswell
William V. Campbell	Entomology	William V. Campbell
Charles A. Dunn	Extension	Charles A. Dunn
Kay McWatters	Food Science	Kay McWatters
Lawton E. Samples	Irrigation	Lawton E. Samples
Robert L. Ory*	New Products-Biochemistry	Esam M. Ahmed

*Served six consecutive years - not eligible for nomination.

Proposed changes in journal policy are as follows:

1) Free reprints to author be eliminated, effective immediately.

2) Publication of a Annual Index for subjects and authors with the first to be a six-year index to bring the journal current.

I express sincere appreciation to each Editorial Board Member for a job well done and to the APREA membership for their active support of PEANUT SCIENCE.

Respectfully submitted,

Harold E. Pattee
Editor

APREA PEANUT RESEARCH

Report of Editors to the American Peanut Research and Education Association, Inc., 11th Annual Meeting, Tulsa, Oklahoma, July 10-13, 1979.

Ray O. Hammons and J. E. Cheek

Four issues of APREA PEANUT RESEARCH (Volume 15 No. 6/16 No. 1-Volume 16 No. 4, Issues 67-70) were compiled, edited, published and mailed to the membership during the year.

Circulation was to about 572 individual members or institutions in the U. S. and abroad.

PEANUT RESEARCH is sent to Libraries of Land-grant institutions in the Southern United States, to the USDA-SEA National Agricultural Library, to various abstracting services and to several agricultural periodicals.

All information issuances from APREA officers were published. 241 selected references and 34 theses or dissertations were documented.

REPORT OF THE 1978-1979 PEANUT QUALITY COMMITTEE

During the year, six additional proposed methods (listed below) were received giving a present total of 20 methods. The 14 earlier methods were listed in last years proceedings.

Oil Content. Applicable to raw or roasted, fresh or rancid peanuts, shelled stock only, and peanut products such as peanut butter. by Jack C. Kuck and A. J. St. Angelo.

Viability Testing of Seed Peanuts with 2,3,5-triphenyl Tetrazolium Chloride. Applicable to raw shelled peanut seed. by R. P. Moore.

Processing Test - Salting. Applicable to raw shelled edible peanuts and blanched salting stock peanuts. by Sam R. Cecil.

Processing Test - Roasting for Peanut Butter. Applicable to raw shelled edible peanuts. by Sam R. Cecil.

Preparation of Methyl Esters of Long Chain Fatty Acids of Peanut Oil. This procedure is suitable for the quantitative conversion of fatty acids of whole peanut oil and lipid subclasses to fatty acid methyl esters for further analysis by methods such as GLC. by Timothy H. Sanders.

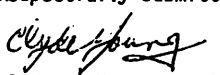
Moisture Measurement - Peanuts. This standard is to provide a uniform method for determining the moisture content of unground samples of peanuts in which the moisture content of hulls and kernels is to be separately established. by James Young and Committee.

The attendance at the annual committee meeting was good and was attended by: Paul Blankenship, USDA National Peanut Research Lab; William H. Bordt, CPC International; Sam Cecil, Georgia Station; Jim Davidson, USDA National Peanut Research Lab; Lakho L. Khatri, Swift & Co., R&D Center; Walton Mozingo, VPI & SU; Wilbur A. Parker, Pert Lab; Joseph Pominski, Southern Regional Research Center; Timothy H. Sanders, USDA National Peanut Research Lab; Doyle Welch, Deleon Peanut Co; James H. Young, N. C. State University; and Clyde T. Young, N. C. State University. These individuals are on the 1979-80 Peanut Quality Methods Sub-Committee.

The present status of the methods and instructions to authors and reviewers was discussed. The following goals for the coming year were established: (1) Have at least 20 methods ready for publication at the 1980 meeting; (2) Have publication details ready to present to the APREA board at the 1980 meeting; (3) Solicit the commercial peanut industry for a list of methods that they would like to see published; (4) Selected Jim Davidson to try and obtain more engineering type methods; and (5) Seek dual approval of methods wherein possible such as the presently submitted moisture method.

Readers are referred to last years proceeding (page 106-107) for additional details.

Respectfully submitted,



Clyde T. Young, Chairman

REPORT OF THE NOMINATING COMMITTEE

Astor Perry, Chairman

The nominating committee after long and careful deliberations suggest the following for your consideration:

President Elect — A.H. Allison

Secretary Treasurer — Don Smith

State Employee Representative — Ron Henning

Industry Representative – (Production) — L.L. Hodges

Industry Representative - (Shelling, Marketing, and Storage)- W.M. Birdsong

Presentation of the Fifth Annual
Bailey Award

Eleventh Annual Meeting of the
American Peanut Research and Education Association
Camelot Inn, Tulsa, Oklahoma
July 10-13, 1979
by

A. J. Norden - President - APREA
Business Meeting - July 13, 1979

This award was established in honor of WALLACE K. BAILEY, an eminent peanut scientist and long-time leader for Peanut Investigations in the U.S.D.A. Agricultural Research Service. Wallace Bailey was one of the small group of people that formed the Peanut Improvement Working Group which later became the American Peanut Research and Education Association.

The BAILEY AWARD is presented each year to that scientist or scientists presenting the best paper at the previous year's annual meeting as determined by the Bailey Award Committee.

Each paper presented at the 1978 meeting in Gainesville, Florida was considered. They were judged for merit, originality, clarity, and contribution to scientific peanut knowledge. Manuscripts, based on oral presentations, were obtained from the authors for evaluation by the award committee. This year's Bailey Award Committee was:

Morris Porter, Chmn, (1980)	Olin Smith (1981)
Pete Bloom (1979)	Milton Walker (1981)
Johnny Wynne (1981)	Kay McWhatters (1982)

I want to commend this committee for handling a difficult responsibility in an outstanding manner.

Now it is my privilege as president to present the Bailey Award to David A. Nickle and David W. Hagstrum for their excellent paper entitled "Provisioning With Pre-paralyzed Hosts To Improve Parasite Effectiveness: A Pest Management Strategy for Stored Commodities." Dr. Nickle and Dr. Hagstrum are with the USDA-SEA-AR Insect Attractants, Behavior, and Basic Biology Research Laboratory, Gainesville, Florida, the former under a cooperative research agreement with the Department of Entomology and Nematology, University of Florida.

INITIAL REPORT

Ad Hoc Committee

Revision of PEANUTS, CULTURE AND USES

July 10, 1979

In early March, an ad hoc committee was appointed by President Norden and charged with the following objectives:

1. Determine the objectives and purpose of the new book.
2. Determine the audience to which it should be directed, principally.
3. Chapter topics and suggested authors.
4. Length of chapters, books, etc.
5. No. of copies.
6. Nomenclature or type of units.
7. Selection of the editors.
8. Propose a time schedule.

Each member of the committee was subsequently contacted and requested to comment on the above. A meeting was held this afternoon to formulate recommendations to this Board about those items above with which the committee has dealt. These recommendations are as follows:

1. The purpose of the book should be to summarize the current state of peanut science by cumulation of the latest and most important knowledge about the peanut under one cover. Where possible, this information should be presented in such a manner that it is accessible and useable by well-trained farmers as well as scientists. The book must be revised and updated so as to appeal to persons who have copies of the present edition in addition to those new to peanut science and technology.

2. That Dr. Clyde Young and Dr. Harold Pattee be requested to act as co-editors of the new book and that they seek Dr. Wilson's help to the limited extent he has outlined if they so desire.

3. That this ad hoc committee or some other committee in cooperation with the editors determine the chapters to be included and secure the authors. This committee should not necessarily be bound to select previous authors if in their judgment others are more qualified. Co-authorship involving both research and extension scientists may be advisable in many cases.

4. The new book should approximate 600 pages or less if possible and not cost more than $30.00. Authors should be asked to use considerable restraint on chapter lengths or given mandates.

5. Approximately 2000 copies as a target.

6. The book will need to use metric units generally but the authors should be requested to express the English equivalents in parentheses where feasible. The book should include a comprehensive table for conversion of units.

7. The following time schedule is proposed:

   a. Selection of topics and authors by December 1979.

   b. Manuscripts completed and criticized - December 1980.

   c. Printed and ready for circulation - Late 1981.

Respectively submitted:

Donald Banks

Gale Buchannon

R. J. Henning

Donald Smith

Thomas Whitaker

D. L. Hallock, Chm.

REPORT OF THE PUBLIC RELATIONS COMMITTEE
JULY 10, 1979, TULSA, OK

The committee was composed of the following persons: Luther Farrar, Larry Hodges, James Keel, S. Womack Lee, J. W. Tanner and Charles Simpson. Due to the distance involved between members all business of the committee was conducted via mail. Potential members of APREA were categorized into four groups with committee member assignments as follows:

1. State and Federal Agencies and Institutions

   Farrar, Simpson and Allison assigned

2. Out-of-Country

   Tanner and Keel assigned

3. Chemical Industry

   Hodges and Keel assigned

4. Shellers, Manufactures and Grower Associations

   Lee assigned

These responsibilities and assignments were made by my letter of November 28, 1978. Peanut Specialists in each state were requested to assist the committee carry out their responsibilities as requested by committee members and others. Supplies of the very fine brochure entitled, "APREA - *Its History, Purposes and Goals*" were nearly exhausted when the committee began its work. Therefore to fill this need the Executive Secretary prepared a mimeograph entitled "*APREA Publications*" which served the purpose very well of explaining APREA's function to potential members. The committee would strongly recommend that the former publication, "*APREA - Its History, Purposes and Goals*" be updated and reprinted in time for the newly appointed Public Relations Committee, when it begins to function to promote the 1980 annual conference.

A news article was written and mailed to all major agriculture publications, announcing the Oklahoma conference. Copies of all mailings were sent to the extension peanut specialist(s) in each state. This news article apparently was mailed out too late to get into all of the major agricultural publications. The committee would urge subsequent committees to make at least two (2) timely news articles/or announcements for wider and earlier media distribution.

Respectfully submitted,

Allen H. Allison, Chairman
Public Relations Committee, 1979

REPORT OF THE PUBLIC RELATIONS COMMITTEE

JULY 1o, 1979, TULSA, OK

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Respectfully submitted,

Allen H. Allison, Chairman
Public Relations Committee, 1979

REPORT OF THE 1979 SITE COMMITTEE

Ken Garren - Chairman
Walton Mozingo
C. C. Brooks
A. H. Allison

According to past procedures, Virginia is scheduled to host the 1980 conference of the American Peanut Research and Education Association's annual conference. With this in mind, I am pleased, on behalf, of all peanut interests in the Old Dominion to extend to its officers, board and membership a formal invitation to visit us next July 15-18, at the Richmond Hyatt House, in Richmond, Virginia. The site committee appointed by president Norden, looked at the possibilities in Norfolk, Virginia Beach, Williamsburg and Richmond. The site selection committee chose Richmond (although the decision was not unanimous) after which the board of directors voted (by mail) to approve. We, the site committee have accepted on behalf of your board of directors and have directed the Richmond Hyatt House to reserve 200 rooms during the period July 15-18, 1980. Should we use more than 200 rooms here at the Camelot, they will increase the room number accordingly, up to 250. In addition they have reserved four (4) suites which can be used as hospitality suites. They have agreed to supply us with 1,000 return reservation forms. Rooms will be held for us until July 1 after which time, reservations will be accepted on a space available basis and changed their regular rates.

Present rates are: *$38.00 Singles*
48.00 Doubles

Exclusive of 4% state tax

A letter to the site committee chairman, Dr. Garren dated July 5, 1979 lists confirmed rates as follows (for July 1980):

Singles	*$42.00*	*$43.68*
Doubles	*52.00*	*54.08*

Exclusive of 4% state tax.

Respectfully submitted,

Allen H. Allison
for
Kenneth Garren

Report by R. O. Hammons, American Peanut Research and Education Association Liaison Representative to the American Society of Agronomy

As Liaison Representative, I attended the 70th annual meeting of the ASA and the affiliated CSSA and SSSA in Chicago, IL, 3-8 December 1978. The meetings included some 1230 papers organized into 148 traditional and 7 poster sessions containing 100 of the reports. Seven of the presentations -- 5 in the Crop Sciences and 2 in the Soil Sciences -- pertained to peanut research investigations. Of special interest was the paper announcing the development and release of the 'Florigraze' perennial peanut as a new forage legume for the tropics and subtropics.

The ASA Liaison Representative met with ASA officers and served as communicator between the two Societies.

In addition, I participated in the annual meeting of the Crop Registration Committee which I serve as chairman of the Peanut subcommittee.

The next annual meeting of ASA is scheduled for 5-10 August, 1979, at Ft. Collins, Colorado.

BY-LAWS
of
AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY, INC.

ARTICLE I. NAME

Section 1. The name of this organization shall be "AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY, INC."

ARTICLE II. PURPOSE

Section 1. The purpose of the Society shall be to instruct and educate the public on the properties, production, and use of the peanut through the organization and promotion of public discussion groups, forums, lectures, and other programs or presentations to the interested public and to promote scientific research on the properties, production, and use of the peanut by providing forums, treatises, magazines, and other forms of educational material for the publication of scientific information and research papers on the peanut and the dissemination of such information to the interested public.

ARTICLE III. MEMBERSHIP

Section 1. The several classes of membership which shall be recognized are as follows:

a. Individual memberships: Individuals who pay dues at the full rate as fixed by the Board of Directors.

b. Institutional memberships: Libraries of industrial and educational groups or institutions and others that pay dues as fixed by the Board of Directors to receive the publications of the Society. Institutional members are not granted individual member rights.

c. Organizational memberships: Industrial or education groups that pay dues as fixed by the Board of Directors. Organizational members may designate one representative who shall have individual member rights.

d. Sustaining memberships: Industrial organizations and others that pay dues as fixed by the Board of Directors. Sustaining members are those who wish to support this Society financially to an extent beyond minimum requirements as set forth in Section 1c, Article III. Sustaining members may designate one representative who shall have individual member rights. Also, any organization may hold sustaining memberships for any or all of its divisions or sections with individual member rights accorded each sustaining membership.

e. Student memberships: Full-time students who pay dues at a special rate as fixed by the Board of Directors. Persons presently enrolled as full-time students at any recognized college, university, or technical school are eligible for student membership. Post-doctoral students, employed persons taking refresher courses or special employee training programs are not eligible for student memberships.

Section 2. Any member, participant, or representative duly serving on the Board of Directors or a Committee of this Society and who is unable to attend any meeting of the Board of such Committee may be temporarily replaced by an alternate selected by the agency or party served by such member, participant, or representative upon appropriate written notice filed with the president or Committee chairman evidencing such designation or selection.

Section 3. All classes of membership may attend all meetings and participate in discussions. Only individual members or those with individual membership rights may vote and hold office. Members of all classes shall receive notification and purposes of meetings, and shall receive minutes of all Proceedings of the American Peanut Research and Education Society.

ARTICLE IV. DUES AND FEES

Section 1. The annual dues shall be determined by the Board of Directors with the advice of the Finance Committee subject to approval by the members at the annual meeting. Minimum annual dues for the five classes of membership shall be:

a.	Individual memberships :	$ 10.00
b.	Institutional memberships :	$ 12.00
c.	Organizational memberships:	$ 25.00
d.	Sustaining memberships :	$100.00
e.	Student memberships :	$ 4.00

Section 2. Dues are receivable on or before July 1 of the year for which the membership is held. Members in arrears on July 31 for dues for the current year shall be dropped from the rolls of this Society provided prior notification of such delinquency was given. Membership shall be reinstated for the current year upon payment of dues.

Section 3. A $15.00 registration fee will be assessed at all regular meetings of the Society. The amount of this fee may be changed upon recommendation of the Finance Committee subject to approval by the Board of Directors.

ARTICLE V. MEETINGS

Section 1. Annual meetings of the Society shall be held for the presentation of papers and/or discussions, and for the transaction of business. At least one general business session will be held during regular annual meetings at which reports from the executive secretary-treasurer and all standing committees will be given, and at which attention will be given to such other matters as the Board of Directors may designate. Also, opportunity shall be provided for discussion of these and other matters that members may wish to have brought before the Board of Directors and/or general membership.

Section 2. Additional meetings may be called by the Board of Directors, either on its own motion or upon request of one-fourth of the members. In either event, the time and place shall be fixed by the Board of Directors.

Section 3. Any member may submit only one paper as senior author for consideration by the program chairman of each annual meeting of the Society. Except for certain papers specifically invited by the Society president or program chairman with the approval of the president, at least one author of any paper presented shall be a member of this Society.

Section 4. Special meetings or projects by a portion of the Society membership, either alone or jointly with other groups, must be approved by the Board of Directors. Any request for the Society to underwrite obligations in connection with a proposed special meeting or project shall be submitted to the Board of Directors, who may obligate the Society to the extent they deem desirable.

Section 5. The executive secretary-treasurer shall give all members written notice of all meetings not less than 60 days in advance of annual meetings and 30 days in advance of all other special project meetings.

ARTICLE VI. QUORUM

Section 1. Until such time as the membership reaches 200 voting members, 20% of the voting members of this Society shall constitute a quorum for the transaction of business. When the membership exceeds 200, a quorum shall consist of 40 voting members.

Section 2. For meetings of the Board of Directors and all committees, a majority of the members duly assigned to such board or committee shall constitute a quorum for the transaction of business.

ARTICLE VII. OFFICERS

Section 1. The officers of this organization shall be:

a. President
b. President-elect
c. Executive Secretary-Treasurer

Section 2. The president and president-elect shall serve from the close of the annual general meeting of this Society to the close of the next annual general meeting. The president-elect shall automatically succeed to the presidency at the close of the annual general meeting. If the president-elect should succeed to the presidency to complete an unexpired term, he shall then also serve as president for the following full term. In the event the president or president-elect, or both, should resign or become unable or unavailable to serve during their terms of office, the Board of Directors shall appoint a president, or both president-elect and president, to complete the unexpired terms until the next annual general meeting when one or both offices, if necessary, will be filled by normal elective procedure. The most recent available past president shall serve as president until the Board of Directors can make such appointment. The president shall serve without monetary compensation.

Section 3. The officers and directors shall be elected by the members in attendance at the annual general meeting from nominees selected by the Nominating Committee or members nominated for this office from the floor. The president-elect shall serve without monetary compensation.

Section 4. The executive secretary-treasurer may serve consecutive yearly terms subject to re-election by the membership at the annual meeting. The tenure of the executive secretary may be discontinued by a two-thirds majority vote of the Board of Directors, who then shall appoint a temporary executive secretary to fill the unexpired term.

Section 5. The president shall arrange and preside at all general meetings of the Board of Directors and with the advice, counsel, and assistance of the president-elect and secretary-treasurer, and subject to consultation with the Board of Directors, shall carry on, transact, and supervise the interim affairs of the Society and provide leadership in the promotion of the objectives of this Society.

Section 6. The president-elect shall be program chairman, responsible for development and coordination of the overall program of the educational phase of the annual meetings.

Section 7. (a) The executive secretary-treasurer shall countersign all deeds, leases, and conveyances executed by the Society and affix the seal of the Society thereto and to such other papers as shall be required or directed to be sealed. (b) The executive secretary-treasurer shall keep a record of the deliberations of the Board of Directors, and keep safely and systematically all books, papers, records, and documents belonging to the Society, or in any wise pertaining to the business thereof. (c) The executive secretary-treasurer shall keep account for all monies, credits, debts, and property, of any and every nature, of this Society, which shall come into his hands or be disbursed and shall render such accounts, statements, and inventories of monies, debts, and property, as shall be required by the Board of Directors. (d) The executive secretary-treasurer shall prepare and distribute all notices and reports as directed in these By-Laws, and other information deemed necessary by the Board of Directors to keep the membership well informed of the Society activities.

ARTICLE VIII. BOARD OF DIRECTORS

Section 1. The Board of Directors shall consist of the following:

a. The president

b. The most immediate past president able to serve

c. The president-elect (elected annually)

d. State employees' representative - this director is one whose employment is state sponsored and whose relation to peanuts principally concerns research, and/or educational, and/or regulatory pursuits.

e. United States Department of Agriculture representative - this director is one whose employment is directly sponsored by the USDA or one of its agencies and whose relation to peanuts principally concerns research, and/or educational, and/or regulatory pursuits.

f. Three Private Peanut Industry representatives - these directors are those whose employment is privately sponsored and whose principal activity with peanuts concerns: (1) the production of farmers' stock peanuts; (2) the

shelling, marketing, and storage of raw peanuts; (3) the production or preparation of consumer food-stuffs or manufactured products containing whole or parts of peanuts.

g. A person oriented toward research - to be named by the chairman of the Board of Directors of the National Peanut Council.

h. The executive secretary-treasurer - non-voting member of the Board of Directors who may be compensated for his services on a part of full-time salary stipulated by the Board of Directors in consultation with the Finance Committee.

i. The president of the National Peanut Council - a non-voting member.

Section 2. The Board of Directors shall determine the time and place of regular and special meetings and may authorize or direct the president to call special meetings whenever the functions, programs, and operations of the Society shall require special attention. All members of the Board of Directors shall be given at least 10 days advance notice of all meetings; except that in emergency cases, three days advance notice shall be sufficient.

Section 3. The Board of Directors will act as the legal representative of the Society when necessary and, as such, shall administer Society property and affairs. The Board of Directors shall be the final authority on these affairs in conformity with the By-Laws.

Section 4. The Board of Directors shall make and submit to this Society such recommendations, suggestions, functions, operations, and programs as may appear necessary, advisable, or worthwhile.

Section 5. Contingencies not provided for elsewhere in these By-Laws shall be handled by the Board of Directors in a manner they deem desirable.

ARTICLE IX. COMMITTEES

Section 1. Members of the committees of the Society shall be appointed by the president and shall serve 2-year terms unless otherwise stipulated. The president shall appoint a chairman of each committee from among the incumbent committeemen. The Board of Directors may, by a two-thirds vote, reject committee appointments. Appointments made to fill unexpected vacancies by incapacity of any committee member shall be only for the unexpired term of the incapacitated committeeman. Unless otherwise specified in these By-Laws, any committee member may be reappointed to succeed himself, and may serve on two or more committees concurrently but shall not hold concurrent chairmanships. Initially, one-half of the members, or the nearest (smaller) part thereto, of each committee will serve one-year terms as designated by the president.

a. Finance Committee: This committee shall include at least four members, one each representing State-, and USDA-, and two from Private Business - segments of the peanut industry. This committee shall be responsible for preparation of the financial budget of the Society and for promoting sound fiscal policies within the Society. They shall direct the audit of all financial records of the Society annually, and make such recommendations as they deem necessary or as requested or directed by the Board of Directors. The term of the chairman shall close with preparation of the budget for the following year, or with the close of the annual meeting at which a report is given on the work of the Finance Committee under his chairmanship, whichever is later.

b. Nominating Committee: This committee shall consist of at least three members appointed to one-year terms, one each representing State-, USDA-, and Private Business - segments of the peanut industry. This committee shall nominate individual members to fill the positions as described and in the manner set forth in Articles VII and VIII of these By-Laws and shall convey their nominations to the president of this Society on or before the date of the annual meeting. The committee shall, insofar as possible, make nominations for the president-elect that will provide a balance among the various segments of the industry and a rotation among federal, state, and industry members. The willingness of any nominee to accept the responsibility of the position shall

be ascertained by the committee (or members making nominations at general meetings) prior to the election. No person may succeed himself as a member of this committee.

c. Publications and Editorial Committee: This committee shall consist of at least three members appointed for indeterminate terms, one each representing State-, USDA-, and Private Business - segments of the peanut industry. This committee shall be responsible for the publication of the proceedings of all general meetings and such other Society sponsored publications as directed by the Board of Directors in consultation with the Finance Committee. This committee shall formulate and enforce the editorial policies for all publications of the Society subject to the directives from the Board of Directors.

d. Peanut Quality Committee: This committee shall include at least seven members, one each actively involved in research in peanuts - (1) varietal development-, (2) production and marketing practices related to quality-, and (3) physical and chemical properties related to quality, and one each representing the Grower-, Sheller-, Manufacturer-, and Services- (Pesticides and Harvesting Machinery, in particular) - segments of the peanut industry. This committee shall actively seek improvement in the quality of raw and processed peanuts and peanut products through promotion of mechanisms for the elucidation and solution of major problems and deficiencies.

e. Public Relations Committee: This committee shall include at least six members, one each representing the State-, USDA-, Grower-, Sheller-, Manufacturer-, and Services-, segments of the peanut industry. This committee shall provide leadership and direction for the Society in the following areas:

(1) Membership: development and implementation of mechanisms to create interest in the Society and increase its membership.

(2) Cooperation: advise the Board of Directors relative to the extent and type of cooperation and/or affiliation this Society should pursue and/or support with other organizations.

(3) Necrology: proper recognition of decreased members.

(4) Resolutions: proper recognition of special services provided by members and friends of the Society.

ARTICLE X. DIVISIONS

Section 1. A Divisions within the Society may be created upon recommendation of the Board of Directors, or members may petition the Board of Directors for such status, by a two-thirds vote of the general membership. Likewise, in a similar manner, a Division may be dissolved.

Section 2. Divisions may establish or dissolve Subdivisions upon the approval of the Board of Directors.

Section 3. Divisions may make By-Laws for their own government, provided they are consistent with the rules and regulations of the Society, but no dues may be assessed. Divisions and Subdivisions may elect officers (chairman, vice-chairman to succeed to the chairmanship, and a secretary) and appoint committees, provided that the efforts thereof do not overlap or conflict with those of the officers and committees of the main body of the Society.

ARTICLE XI. AMENDMENTS

Section 1. These By-Laws may be amended consistent with the provisions of the Articles of Incorporation by a two-thirds vote of all the eligible voting members present at any regular business meeting, provided such amendments shall be submitted in writing to each member of the Board of Directors at least thirty days before the meeting at which the action is to be taken.

Section 2. A By-Law or amendment to a By-Law shall take effect immediately upon its adoption, except that the Board of Directors may establish a transition

schedule when it considers that the change may best be effected over a period of time. The amendment and transition schedule, if any, shall be published in the "Proceedings of APRES".

Amended at the Annual Business Meeting of the American Peanut Research and Education Society, Inc., July 13, 1979, Tulsa, Oklahoma.

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SEPARATED BY MEMBERSHIP TYPES

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