THE INFLUENCE OF TIME OF HARVESTING DIXIE
SPANISH PEANUTS ON MATURITY
YIELD AND GRADE

By

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CHAPTER I

INTRODUCTION

Precise information on the development of Spanish peanut plants is needed to determine the optimum time to harvest for maximum yield of high quality peanuts.

Several factors are responsible for the concern over maturity determination in the peanut. The indeterminate growth habit makes an accurate prediction of the optimum time to harvest very difficult. Off flavor has been related to both immature and overmature peanuts. The wide range of moisture content in peanuts containing a large number of immature fruits causes complications in curing and also contributes to off flavor. Hard peanuts have exhibited correlations of hardness with factors associated with maturity.

Field and growth chamber experiments were used in an effort to determine when optimum maturity occurred. These experiments were conducted to measure some of the factors related to maturity of the peanut.

CHAPTER II

REVIEW OF LITERATURE

Limited work has been reported on the actual determination of maturity on the peanut in relation to the time of harvest. Pertinent literature has been reviewed.

A knowledge of the blooming cycle of *Arachis hypogaea L.* is necessary to understand fully the nature of the problem. The peanut is indeterminate in growth habit (20). Its flowering cycle extends from approximately five weeks after planting until the first frost (7). Bolhuis and DeGroot (4) reported that commencement of flowering depended greatly on temperature. Differences in flowering and fruit development were found only in relation to the optimum temperature and the number of flowers formed each day. Greater tolerance to different temperatures was found as the latitude increased from which the varieties originated. The effect of temperature on flowering was chiefly reflected in flower development. Bolhuis (2) stated that the flowering cycle was affected very little by variations in climatic conditions. He cited three stages of flowering which included a brief starting period of floral production, which rapidly reached its peak and in the final stages again rapidly decreased. Shear and Miller (15) found that high temperatures promoted early flowering and hence an earlier maturing crop. No relationship between fluctuations in intensity of flowering and meteorological data was reported by Bolhuis (3).

Smith (18) observed that cyclic flowering with abrupt alternation of high and low frequencies during the major portion of the flowering period was characteristic of the peanut. It was inherent in the developmental process and not directly controlled by environmental factors.

The appearance of gynophores (pegs) follows flowering by at least five days, with seven to eight days required from flowering to fruiting (3). According to Bolhuis, Bentham stated in 1839 that pegs were some kind of a peculiar flower but later recognized the mistake. Gregory (6) found that peg growth began immediately after fertilization. Early growth was slow but gradually accelerated until the pegs elongated very rapidly. The peg was found to be positively geotropic. The ultimate length of a peg and the time required for it to reach the soil was determined by the initial distance from the ground. Pegs initiated more than fifteen centimeters above the soil surface usually failed to reach the ground. In such circumstances the peg tips usually died, and pod and seed development did not occur.

After penetrating the soil, the peg commonly grew to a depth of two to seven centimeters. When the peg reached its maximum penetration of the soil geotropism was lost, and the tip turned to a horizontal position. At the same time the fruit began to enlarge and develop rapidly.

Yellowing of the leaves has been used as an indicator of the proper time to harvest (19). This varies with conditions of growth or environment (8). It was a poor indicator, since several factors other than maturation may cause yellowing of the leaves.

Time of planting or the number of days from planting to harvest has been used to predict maturity with poor results (9). Shear and Miller (16) found that early plantings did not increase yield over later plantings.

The early planted peanuts required more time to reach maximum yield due to the longer time needed to reach the flowering stage. This was an important factor in the time required from planting to digging to obtain maximum levels of mature fruit (15). The late planted peanuts bloomed earlier than the early planted peanuts. The time of blooming seems to be affected by some environmental factor, possibly temperature. The time required from initial bloom to maximum yield was more constant than the time required from planting to maximum yield (16). The time of digging had more effect on maturity than the number of days from planting to digging.

The dry weights of the plant and fruit have been used to express the best time to dig for maximum yield of mature fruit (1, 9, 10, 11, and 12). The plants were hand pulled at different dates. Fruits older than one week were removed from each plant and the weight of the green plant and its fruit was recorded. Each plant and its fruit were oven dried at 100° C. for forty-eight hours, after which the oven-dry weights were determined. Plant weights were more variable than fruit weights and were influenced more by rainfall. Barrs (1) reported that total dry weight of the plant plus the fruit less the roots had a sigmoid curve typical of plant growth phenomena, in which rate of increase declines smoothly over the latter part of the growth curve.

The mean individual kernel weight (MIKW) has been used to determine maturity in the peanut. Barrs (1) reported that the MIKW and the total kernel weight (TKW) became constant at almost the same time, and both rose to similar final values. According to Barrs, the MIKW rose to a constant value for any given variety of mature peanuts. This constant value was reached regardless of environmental conditions. If, through successive tests, this method proves accurate, it would only be necessary to determine MIKW on successive dates until a constant value is reached. Thus, it would offer an immediate estimate of maturity with no risk of delay in harvesting. Matlock (11, 12) has conducted experiments using MIKW and has obtained comparable results.

Maturity may be determined by internal pericarp color. Researchers (9, 11, 13, 17) found that upon reaching maturity the inside of the shell had become a mottled brown to black. This coloration was diffused inward from the mechanical layer of the shell. The material diffused was tannin or polyphenol of the catechol type. Oxidation and polymerization of the tannins were the common source of the brown coloration (14). Matlock (9, 11) and Smith (17) classified the fruit as mature when the interior pericarp was dark, immature when the interior was white, and intermediate when the interior was between these two extremes. Mills (13) used the following classifications: 1 = very immature (internal pericarp color white); 2 = immature (testa white, pericarp color light brown); 3 = mature (testa pink, pericarp dark brown or black); 4 = overmature (testa brown, pericarp black). Investigations by Matlock (12) showed a logical increase in maturity throughout the growing season using this system.

CHAPTER III

MATERIALS AND METHODS

A field experiment was conducted on the Peanut Research Station near Stratford, Oklahoma, located in northeastern Garvin County. The growth chamber study was conducted on the Agronomy Research Station near Stillwater, Oklahoma.

In the Stratford study, a randomized complete block design was used with plantings made at recommended rates and depths. The variety Dixie Spanish was planted on May 22, 1965, in a Stidham sandy loam soil. The study contained six treatments and five replications for each treatment. Each treatment consisted of a four-row plot situated in a continuous stand of peanuts with no alleys. The spacing between rows was forty inches. Weeds were controlled by hand hoeing and cultivation during the growing season. The treatments consisted of harvesting at weekly intervals starting September 10, or 111 days after planting, and proceeding at weekly intervals until October 31, or 146 days. Peanuts were harvested from sixteen feet of the two center rows of each plot for yield and grade determinations.

On each respective harvest date, four plants were pulled at random from the two border rows of each plot to obtain a total of twenty plants for each treatment. After the four plants were removed, two of the four plants from each replication were used for determining the individual plant and fruit weights. The other two plants from each replication were used to obtain detailed maturity data.

The dry matter data were obtained for the plant, fruit, and roots for each of the ten plants per harvest date. The plants and their fruit were placed in a forced draft hot air oven set at 100° C. for a period of forty-eight hours. The per cent dry matter was calculated from the data obtained. This procedure was repeated for each harvest date.

An estimate of maturity was obtained from the plants cured in a dryer set at 90° F. by classifying the fruit as mature, intermediate, or immature according to their inner pericarp color. All of the fruit one week of age or older were removed from the plant. Each fruit was hand shelled and classified. The fruit with dark pigmentation of the interior pericarp were considered mature, those with white interior pericarp as immature, and those between the two extremes as intermediate. The kernels were separated into two groups using the 15/64 x 3/4-inch slotted sieve. The number of kernels riding the 15/64 x 3/4-inch sieve and those passing through the sieve were counted and weighed. The weight of the shells was also recorded so that the shelling percentage could be determined.

After the fruit had been classified on the basis of interior pericarp color, the mean individual kernel weight was determined for each classification and each harvest date. Ten kernels were picked at random from each maturity and size group. These ten kernels were weighed and then dried in the forced draft hot air oven set at 100° C. for a period of forty-eight hours and re-weighed. The mean individual kernel weight was determined by dividing the dry weight of the kernels by the number of kernels.

Representative samples of one pound were taken for grading from replications I and III for each treatment in the test. The percentages of sound mature kernels (SMK), sound splits (SS), other kernels (OK), damaged kernels, and shelled kernels were determined by personnel of the State-Federal Inspection Service at Durant, Oklahoma.

The percentage of sound mature kernels consisted of sound kernels held on the 15/64 x 3/4-inch slotted sieve.

Other kernels consisted of the percentage of undamaged kernels passing through a 15/64 x 3/4-inch slotted sieve. The percentage of No. 1 kernels was determined by adding SMK and SS.

The shelled kernels was the proportion of kernels to pods by weight.

For the Stillwater growth chamber study, a five by five latin square design was used to arrange the twenty-five pots on the bench. One plant of the Dixie Spanish variety of peanut was grown per eight-inch pot in the growth chamber. The growth chamber was set for 85° F. day temperature, 70° F. night temperature, and a thirteen-hour photoperiod at 3,500 foot candles.

The seed were planted in a CN_2-sterilized sandy loam soil on May 27, 1965.

A solution of 15-5-5 and NH_4NO_3 was added to individual plants when mineral deficiency became evident.

Malathion mixed at the rate of 5cc per gallon of water was sprayed on the plants on August 28, September 1, September 3, September 7, and September 17 for red spider mite control. The number of blooms for each plant in each treatment was recorded daily, along with the date of the first peg development.

The treatments consisted of five different harvest dates:

September 13, 23, 28, October 3, 13, or 110, 120, 125, 130, and 140 days from planting, respectively.

The amount of dry matter was determined for each plant and its fruit. The procedure was similar to that used for the Stratford study, except that the fruit were allowed to air dry for a period after the green weight was recorded to facilitate the classification using internal pericarp color. The fruits were oven dried for dry matter determinations. The number of fruits, pops, and pegs was also recorded.

The analysis of variance for most of the data from the Stratford and the Stillwater studies was calculated by the IBM computer at the Oklahoma State University Computer Center. The coefficients of variation and the least significant differences where applicable were determined on a desk calculator.

CHAPTER IV

RESULTS AND DISCUSSION

The rainfall from May through October, 1965, was 15.47 inches, with the highest amounts of 5.32 inches coming in May, and 3.64 inches in July. The monthly rainfall totals for May, June, July, August, September, and October were 5.32 inches, 1.37 inches, 3.64 inches, 1.23 inches, 2.80 inches, and 1.11 inches, respectively. Temperatures ranged from a low average temperature of 64.0^{o} F. in October to a high of 84.5^{o} F. in July. The monthly average temperatures for the six-month period beginning in May and ending in October were 70.5^{o}, 76.5^{o}, 84.5^{o}, 80.9^{o}, 75.1^{o}, and 64.0^{o} F., respectively.

Yield

The mean peanut yields for the Dixie Spanish variety of peanut used in the Stratford study are shown in Figure 1. They were 1275, 1284, 1447, 1463, 1365, and 2011 pounds per acre, respectively, for the September 10, 17, 24, October 1, 8, and 15 harvest dates.

A significant difference in mean yields occurred among harvest dates. The multiple range test indicated that the last harvest date was significantly higher in yields than the earlier harvest dates. The coefficient of variation for yield was 21.0 per cent.

The mean yield increased with each successive harvest with the exception of the October 8 harvest date. The decline on this date was

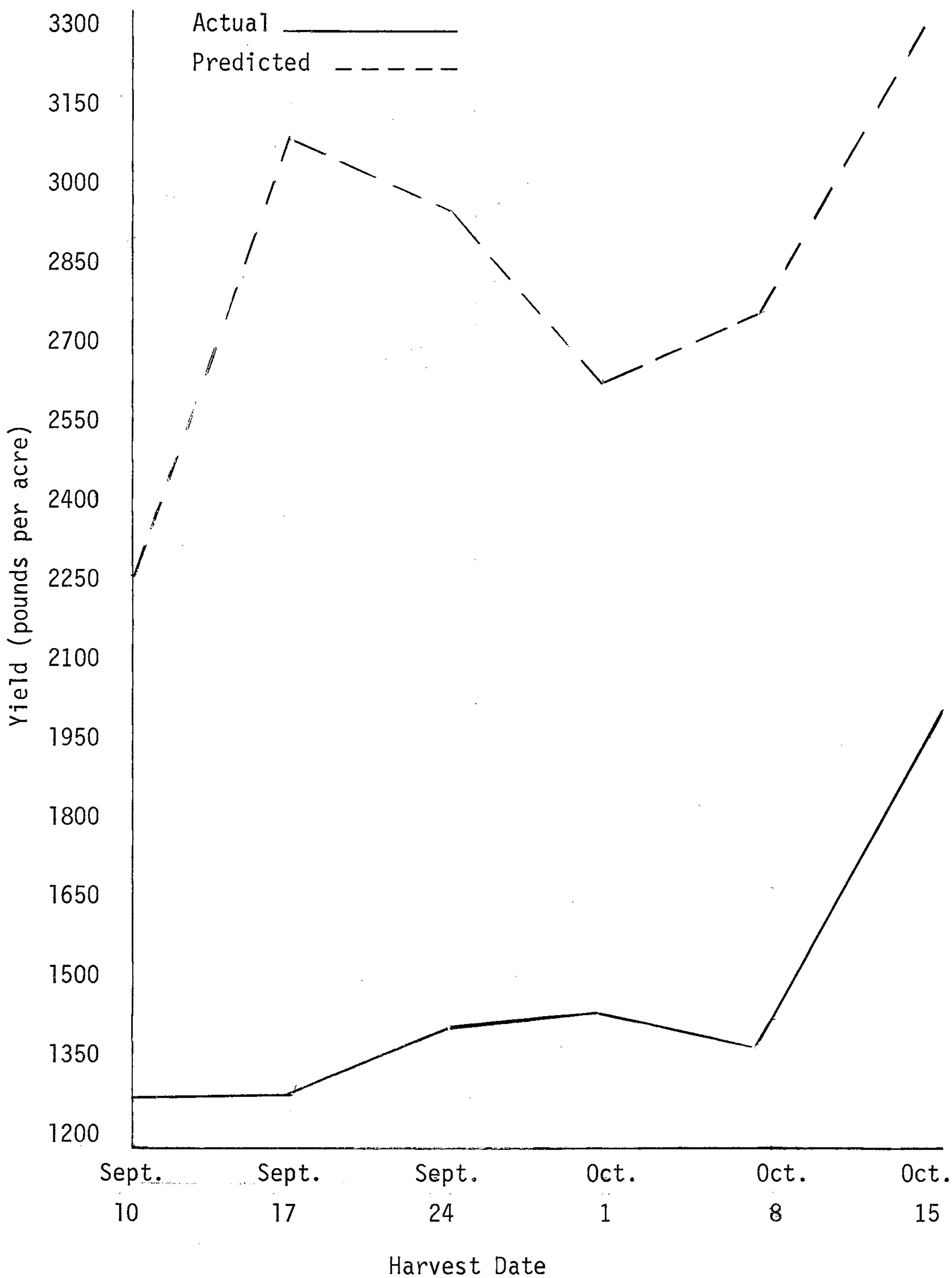

Figure 1. Actual and Predicted Yield for Six Different Harvest Dates, Stratford, 1965.

thought to be due to a reduced stand on one of the plots of this treatment. There was a very rapid increase at the final harvest (Figure 1 and Appendix Table III).

Predicted yields were calculated as shown below, using the mean fruit dry weight for the individual plants pulled at random for the fruit classification.

$$\frac{\text{square feet per acre}}{\text{row width}} = \text{number of linear feet or row per acre}$$

number of feet x plants per foot = plants per acre

plants per acre x yield per plant (pounds) = pounds per acre

The predicted values were considerably higher than the actual yield. They showed a downward trend from the second to the fourth harvest, but yields increased from the September 10 harvest through the final harvest on October 15.

Dry Weight

The mean dry weight of individual plants was 92.4 grams, and the mean fruit weight was 48.4 grams (Appendix Table I). The mean percentage of dry matter for the plant dropped sharply during the first two harvest dates, then started a leveling trend until rising abruptly on the last harvest date. The curve for the dry matter percentage for the fruit was almost the reverse of the yield curve. There was a sharp increase in dry matter between the first two harvest dates, a gentle decline for the October 1 and 8 dates, followed by a rather rapid rise through the final harvest date (Figure 2 and Appendix Table I).

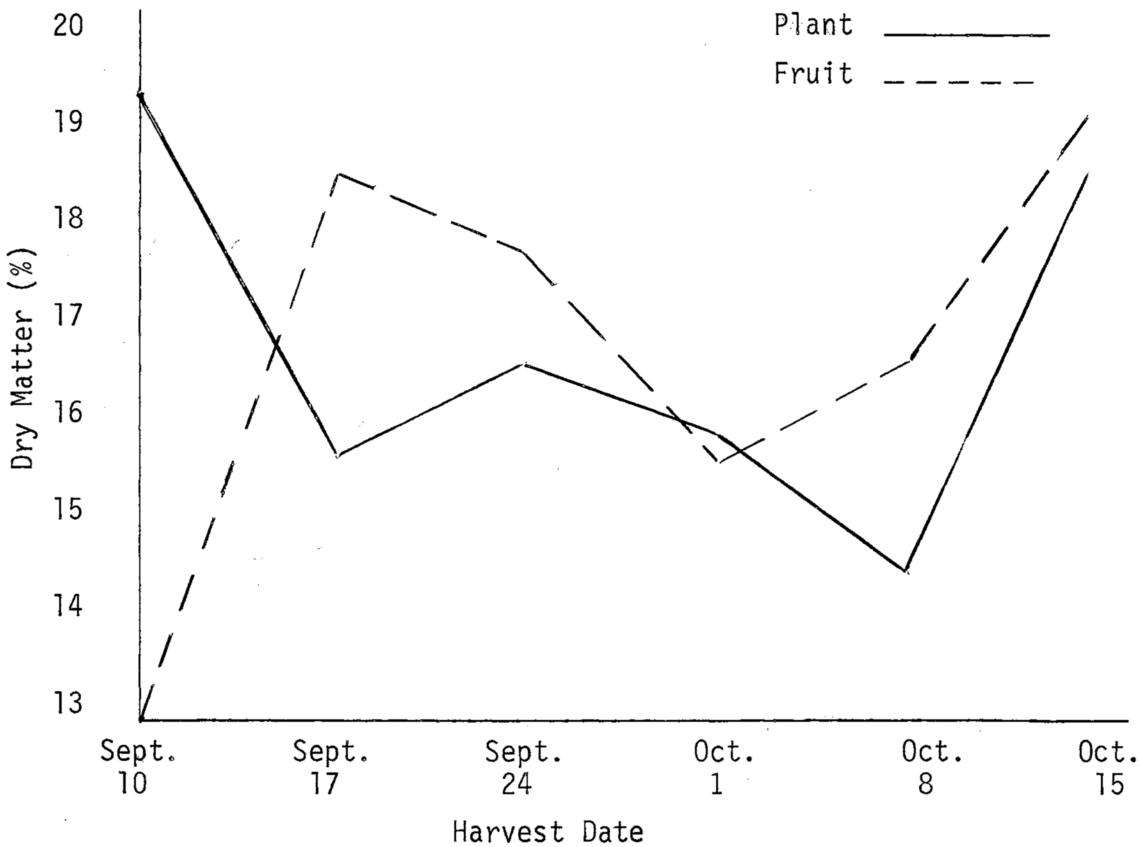

Figure 2. Mean Percentages of Dry Matter for Plant and Fruit for Six Different Harvest Dates, Stratford, 1965.

The analysis of variance indicated no significant differences among harvest dates for mean individual plant and fruit dry weights. The coefficients of variation were 41.0 and 49.1 per cent, respectively, for plant and fruit weights (Appendix Table I).

Mean Individual Kernel Weight

The mean individual kernel weight (MIKW) combined for the maturity groups ranged from 0.34 grams on the September 10 harvest date to 0.38 grams on October 15 (Figure 3 and Appendix Table II).

MIKW remained constant for the first three dates, then increased to higher weights on the last three dates, although it did again remain

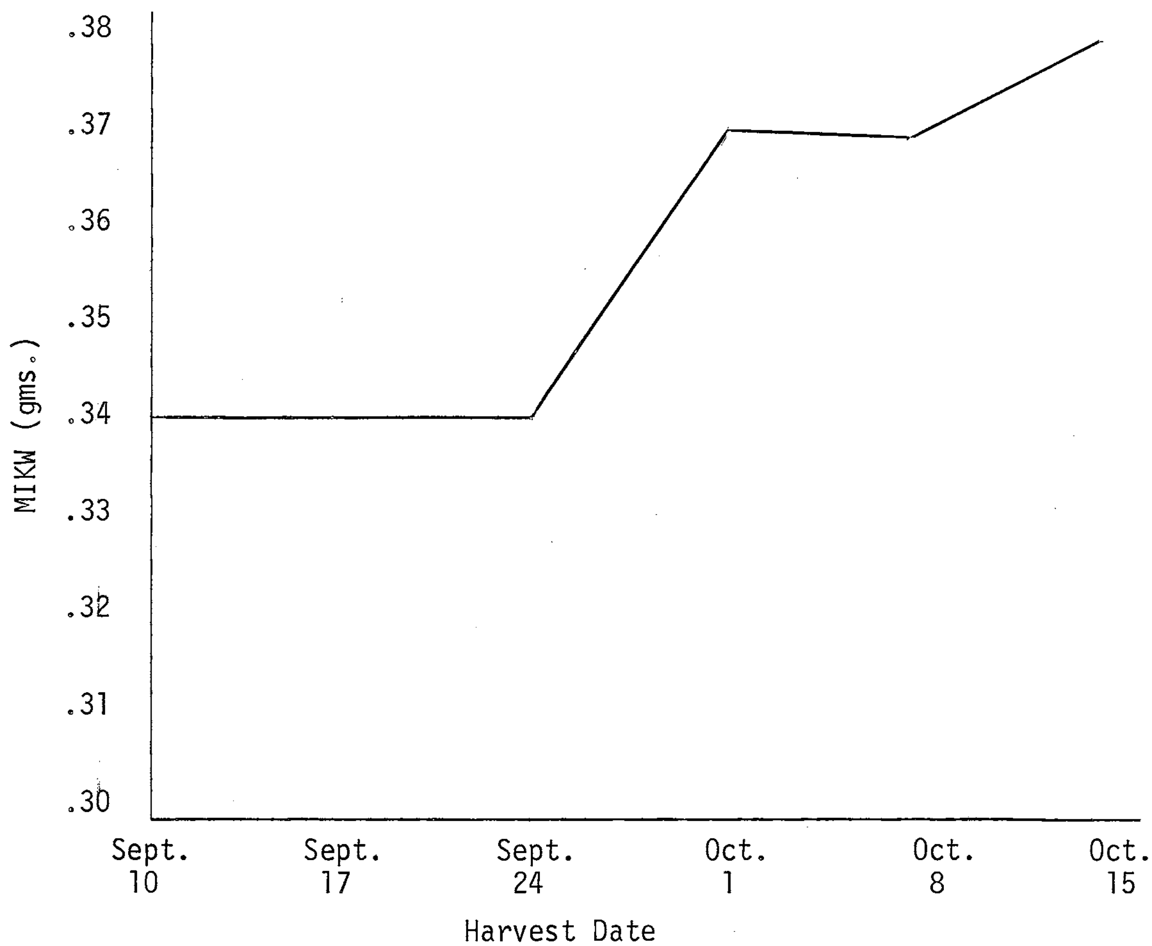

Figure 3. Mean Individual Kernel Weights for Six Different Harvest Dates, Stratford, 1965.

constant for the October 1 and 8 harvest dates. These data were not adequate for statistical analysis, since most of the raw peanuts were saved for organoleptic studies.

Number of Fruits

The mean number of fruits for the six treatments was 44.2 per plant (Appendix Table I). As a whole, the number of fruits showed a sharp decline between the September 10 and 17 harvest dates. They then leveled off until the October 15 harvest date, when they exhibited a very rapid increase (Figure 4).

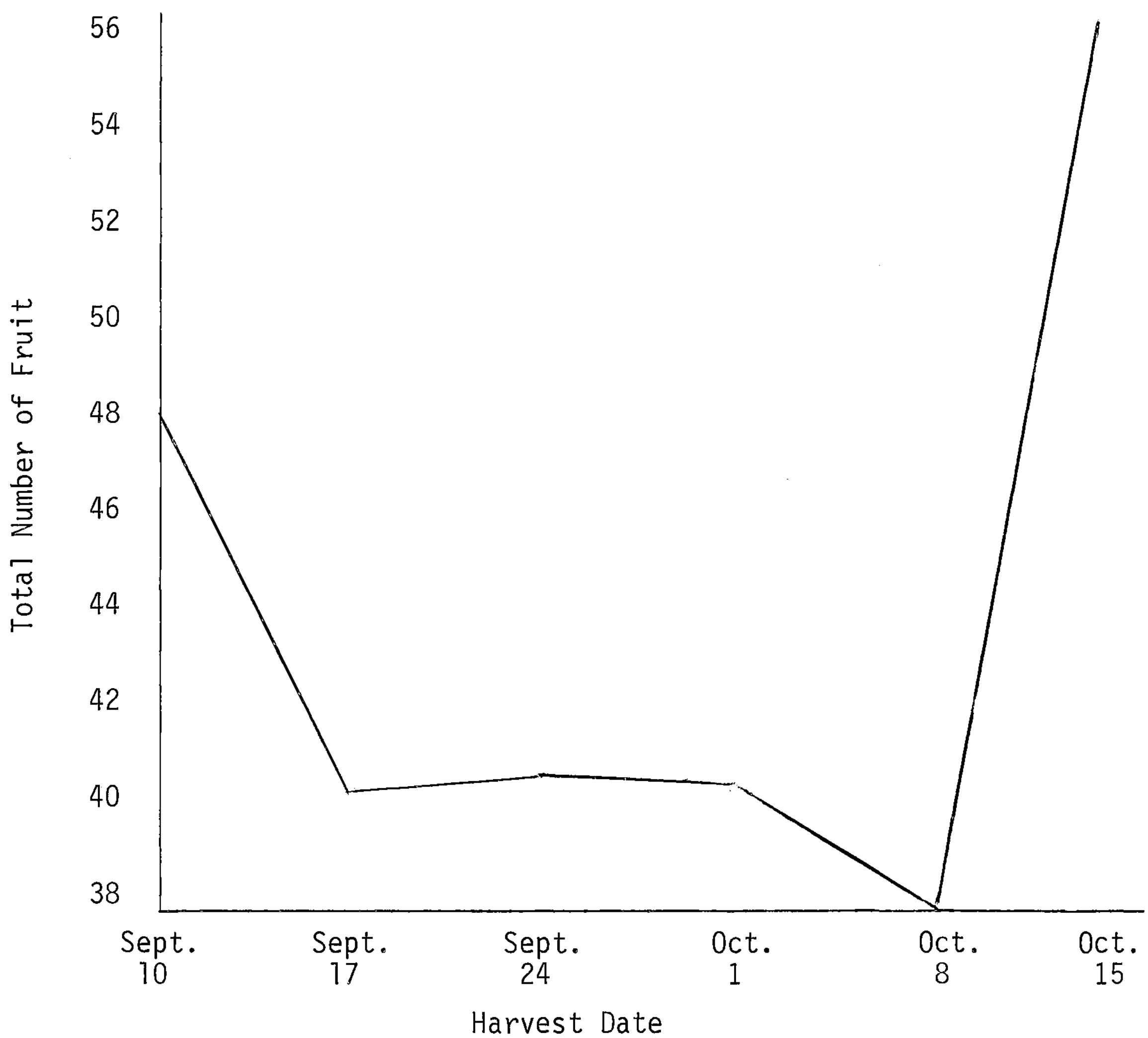

Figure 4. Total Number of Fruit for Six Different Harvest Dates, Stratford, 1965.

There were highly significant differences among harvest dates for the mean number of fruits per plant and maturity groups. The variance for harvest dates x maturity interaction was significant. The coefficient of variation was 63.0 per cent (Appendix Table 5).

The mean number of mature, intermediate, and immature fruit or plants is shown in Figure 5 and Appendix Table 5.

The mean number of mature fruit obtained did not differ significantly among the various harvest dates. In general the number of mature

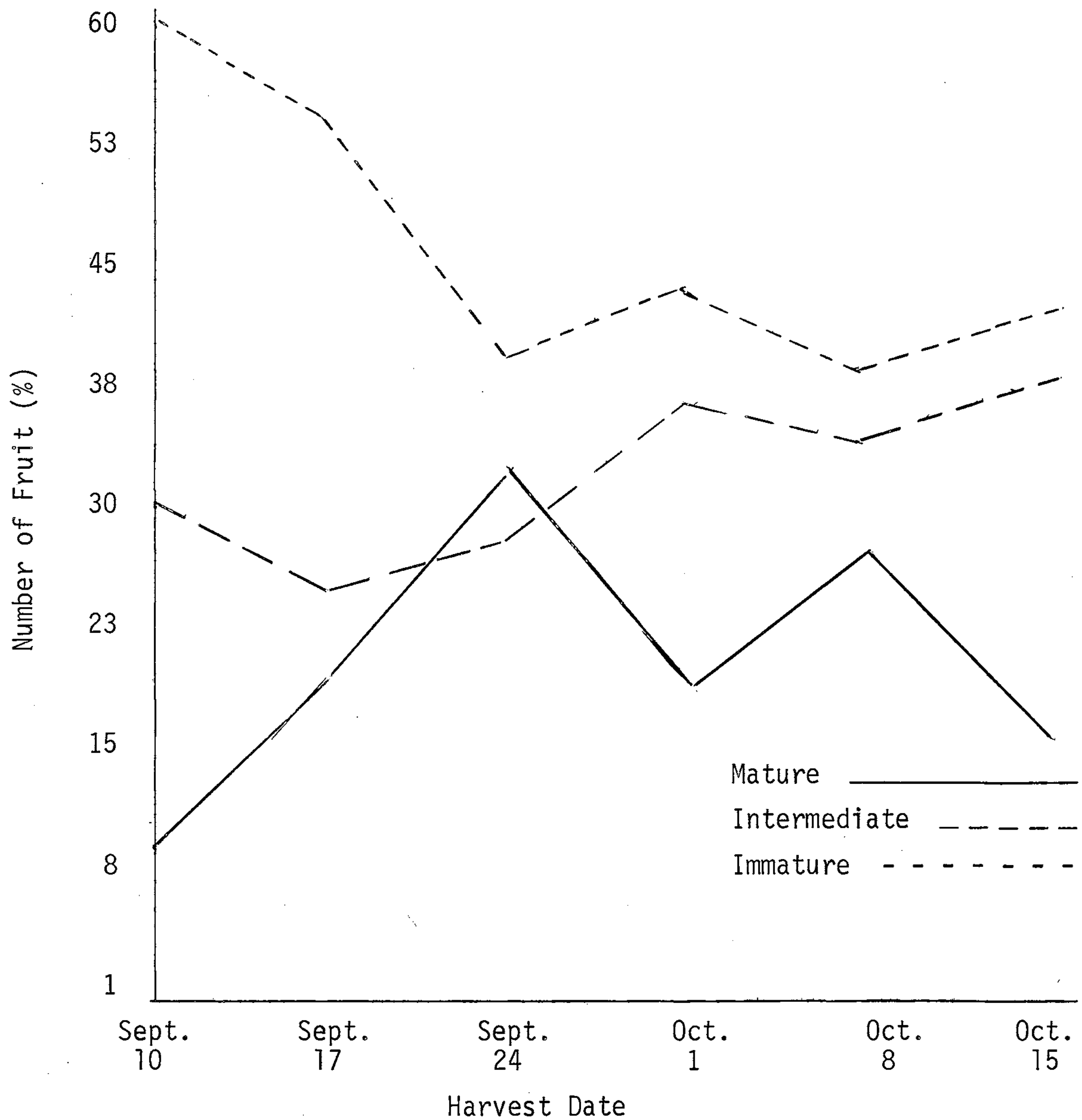

Figure 5. Percentage of the Number of Fruit Classified as Mature, Intermediate, and Immature for Six Different Harvest Dates, Stratford, 1965.

fruit increased rapidly for the first three harvest dates and remained fairly constant thereafter. The coefficient of variation was 93.0 per cent. This high variability may have masked the treatment effect.

A significant difference among harvest dates was indicated for the mean number of intermediate fruit per plant. The coefficient of variation was 57.4 per cent. The intermediate fruit declined from the September 10 to September 17 harvest date, then steadily increased through the October 15 harvest.

The statistical analysis revealed no significant differences among harvest dates with respect to mean number of immature fruit per plant. The coefficient of variation was 74.9 per cent (Appendix Table II). The number of immature fruit tended to decline through the October 8 harvest, then remained constant during the remainder of the harvesting dates (Figure 5).

Number and Weight of Kernels

Since the number and weight of the kernels are related, they will be considered at the same time (Appendix Table XI).

The mean size of the kernels had a highly significant variance. The coefficient of variation was 134.2 per cent (Figure 6 and Appendix Table VII). The number of mature kernels rose steadily through the September 24 harvest date and then declined throughout the final harvest on October 15.

The number of kernels classified as intermediate declined on the September 17 harvest date, then increased steadily through the October 15 harvest date. Harvest dates and the harvest date x size interaction were significant. The coefficient of variation was 71.5 per cent.

The number of immature kernels declined very rapidly through the September 24 harvest date and generally leveled off through the remainder of the harvesting period. Size of the kernels and the harvest date x size interaction were significantly different. The coefficient

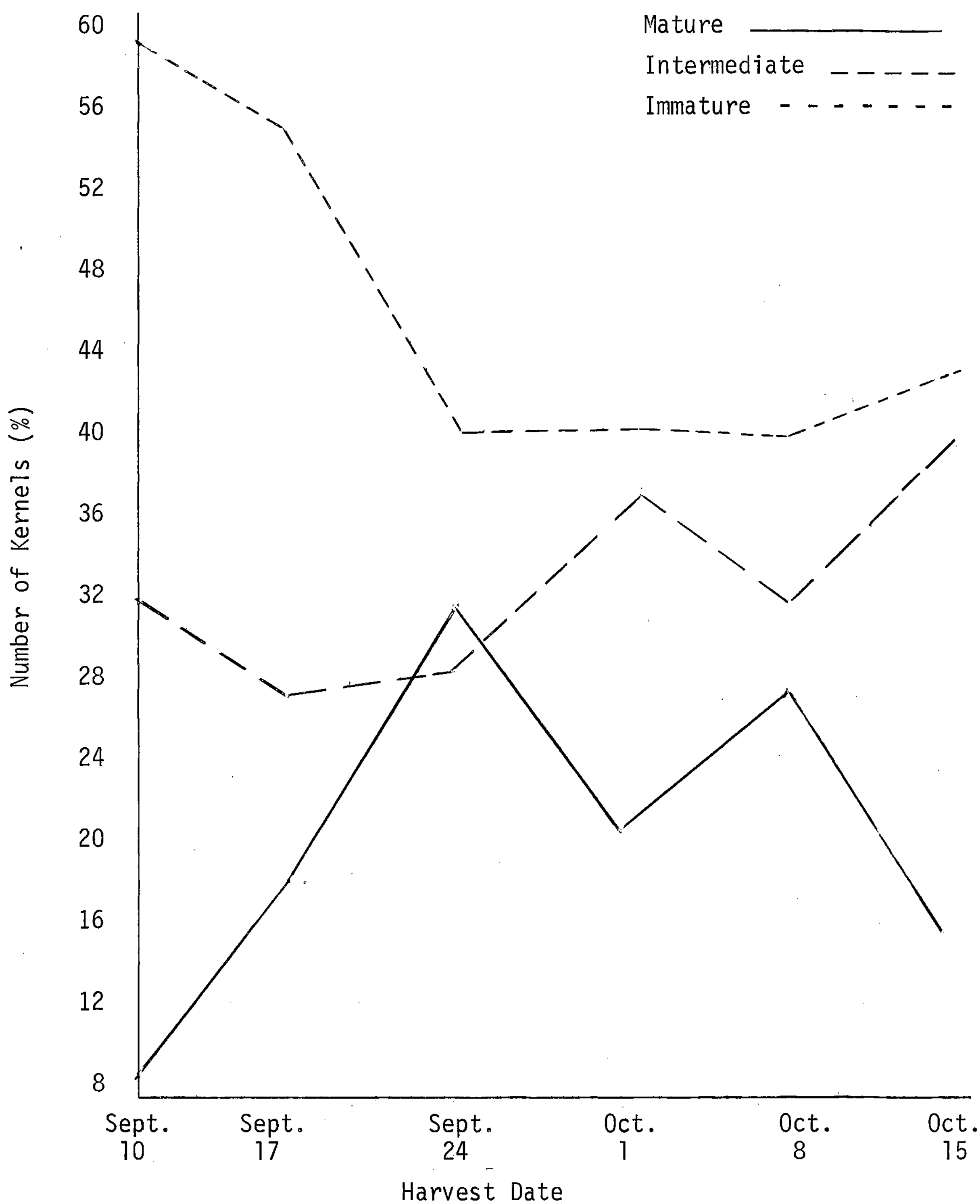

Figure 6. Mean Percentages of the Number of Kernels Classified as Mature, Intermediate, and Immature for Six Different Harvest Dates, Stratford, 1965.

of variation was 81.3 per cent (Appendix Table VI).

The graphs for kernel weight were very similar to those for kernel number, differing because the percentage was based on the total kernels per harvest date (Figure 7 and Appendix Table XI).

Maturity, size, and the maturity x size interaction were highly significant for the total weight of the kernels. Harvest date x size interaction was significantly different at the five per cent level. The coefficient of variation was 96.1 per cent and the LSD at the five per cent level was 3.28 (Appendix Table VIII).

Size was significantly different at the one per cent level for each of the three maturity classifications and the harvest date x size interaction was significant for the intermediate classification (Appendix Table IX). The amount of kernels held on and falling through the 15/64-inch slotted sieve did not remain constant for the various harvest dates (Figures 6, 7, and 8).

Grade

The grade factors consisted of determining the percentage of SMK, SS, OK, and damaged kernels for each harvest treatment (Appendix Table III). In addition, the weight per 100 seed held on the 15/64-inch sieve was determined for each treatment.

An analysis of SMK revealed a significant difference. The coefficient of variation was 2.2 per cent (Appendix Table X). The mean percentage of SMK rose sharply during the September 10 through October 1 harvest dates before leveling off and declining slightly on the October 15 harvest (Figure 8).

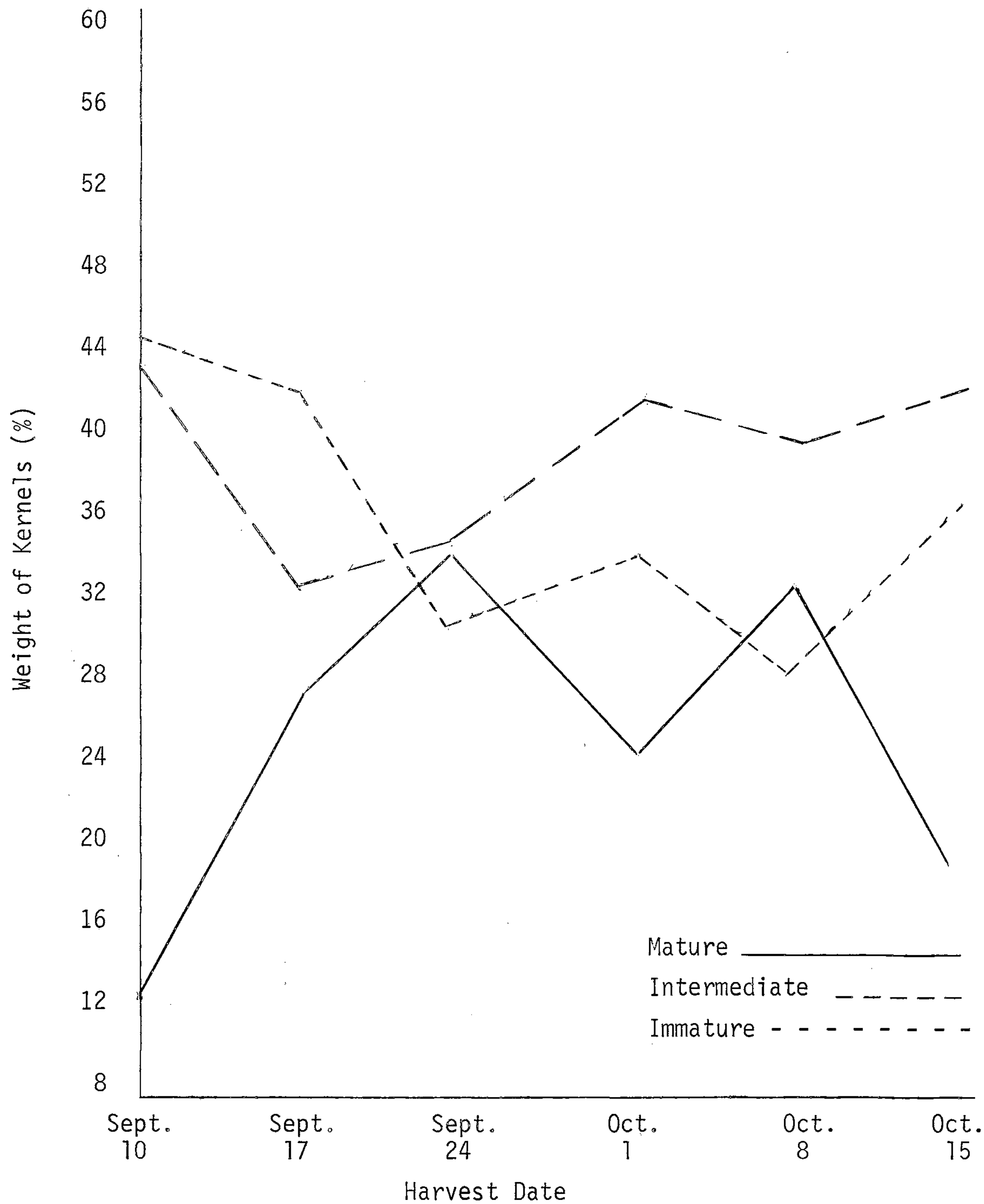

Figure 7. Mean Percentages of the Weight of Kernels Classified as Mature, Intermediate, and Immature for Six Different Harvest Dates, Stratford, 1965.

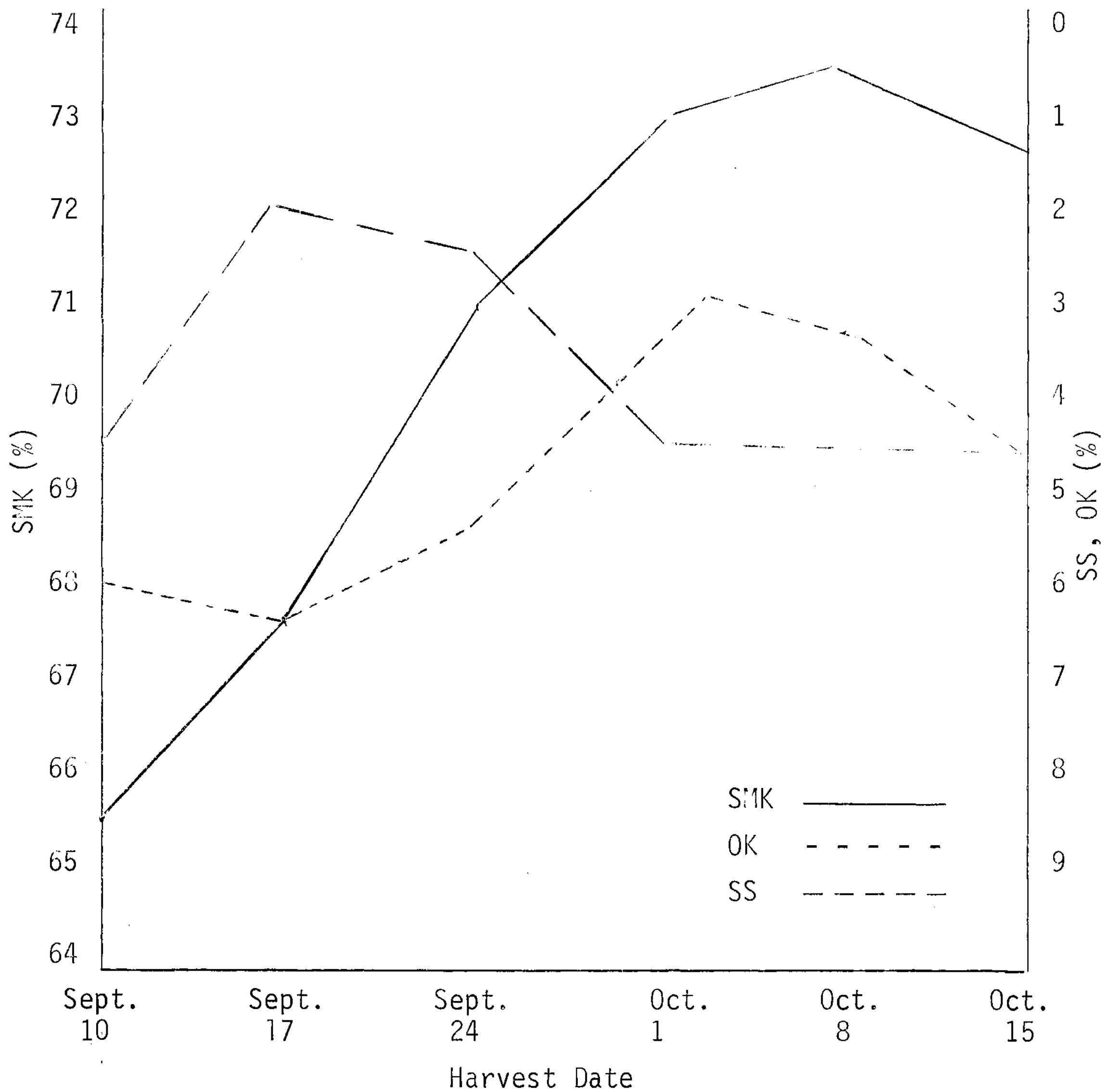

Figure 8. Percentage of SMK, SS, and OK for Six Different Harvest Dates, Stratford, 1965.

Sound splits were significantly different. The coefficient of variation was 15.6 per cent (Appendix Table III). The mean percentage of sound splits declined abruptly on the September 17 harvest date, then increased to a constant level on October 1.

The mean percentage of other kernels declined steadily until the October 1 harvest date, at which time it began a steady increase lasting through the final harvest date on October 15. It did not differ significantly.

The mean percentage of damage was negligible for each sampling date, ranging from 0.0 to 1.5 per cent (Appendix Table III).

The mean weight of 100 seed did not differ significantly among harvest dates. The mean gram weight per 100 seed showed a steady increase throughout the harvesting period, with the exception of a downward fluctuation on the September 24 harvest date (Figure 9 and Appendix Table III).

The mean percentage of meats (shelling percentage) increased through the October 1 harvest date and then remained constant during the latter harvest dates. (Figure 10 and Appendix Table III).

The data obtained in the Stillwater growth chamber are summarized in Appendix Table XII. This was the first attempt at using the growth chamber for growing peanuts at Stillwater, and numerous problems were encountered, both in the growing and the operation of the growth chamber. Generally, the size of the plants and the number of fruit were much less than for the field data. As a result there was great variability among the means for the factors measured as indicated by the high coefficients of variation.

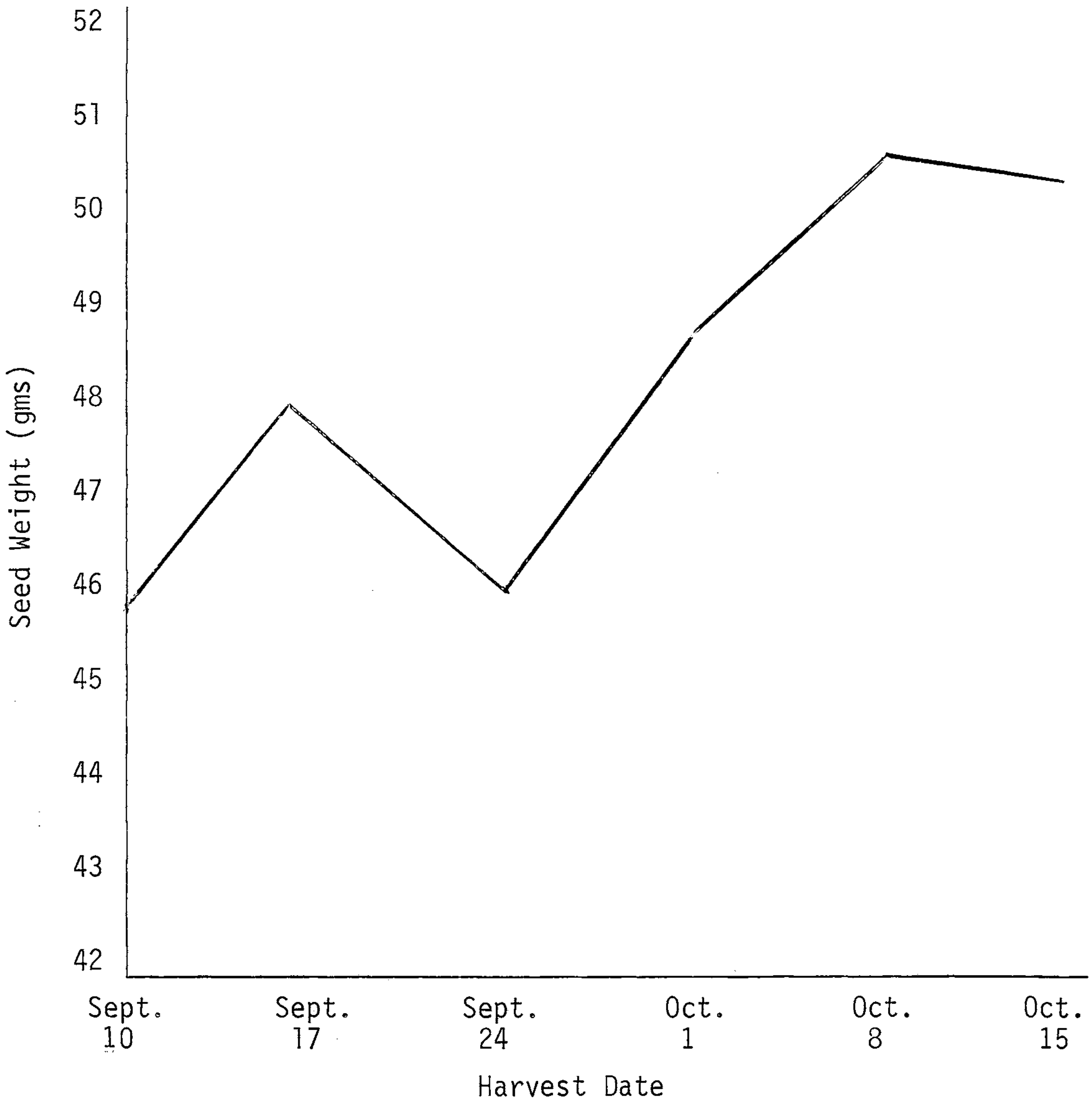

Figure 9. Seed Weight in Grams Per 100 Seed for Six Different Harvest Dates, Stratford, 1965.

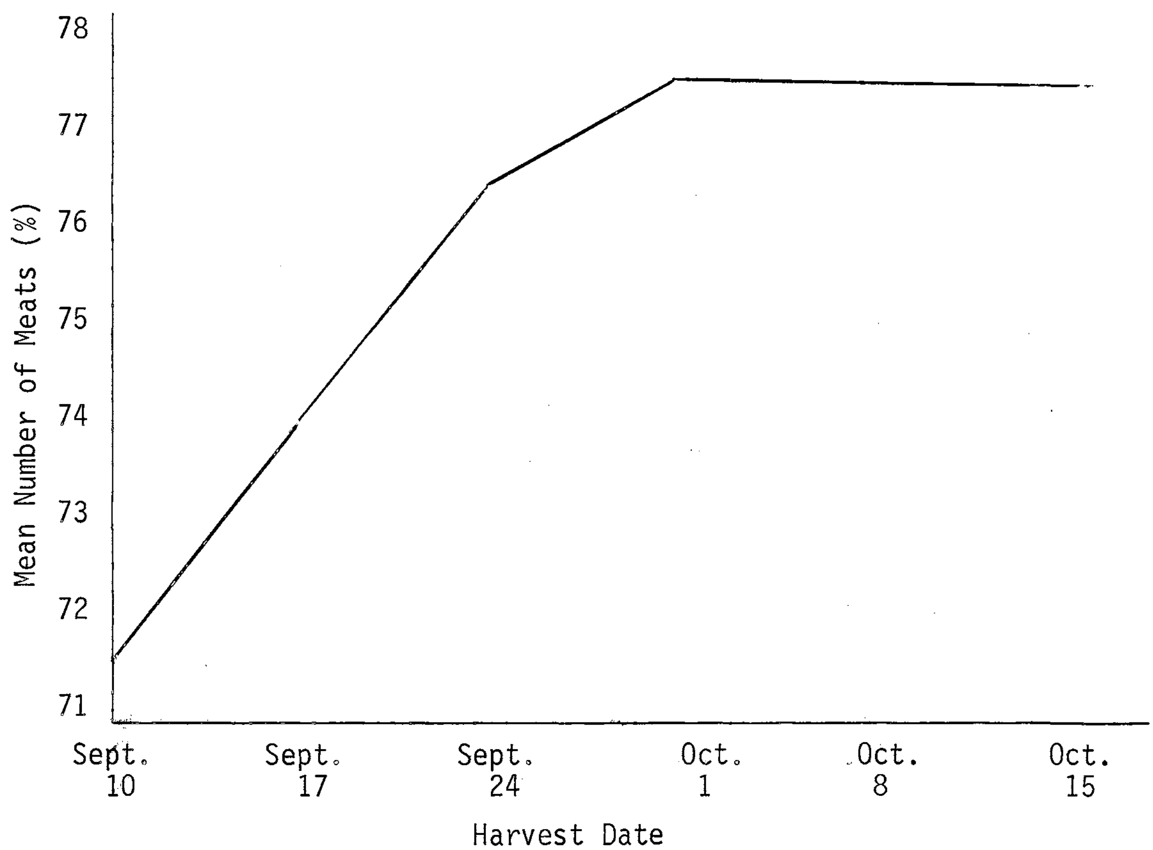

Figure 10. Mean Percentage of Meats for Six Different Harvest Dates, Stratford, 1965.

Bloom Cycle and Reproductive Efficiency

An analysis of variance for the number of blooms recorded in the growth chamber near Stillwater showed no significant differences among treatments. The coefficient of variation was 61.8 per cent.

The mean number of days from planting to emergence was ten and from planting to the first bloom was 33.3. Flowering was cyclic with abrupt alternation of high and low daily flowering frequencies during the major part of the flowering period. Two major peaks were observed. The larger occurred at fifty-five days after planting, while the smaller occurred at forty-three days. A sizeable peak was also observed at thirty-seven days in several treatments. The mean number of days of blooming was 60.0 and ranged from fifty-five to sixty-six days (Figures 11, 12, 13, 14, 15, and 16).

The reproductive efficiency was calculated by dividing the number of fruit and pegs by the number of blooms. The results are as follows:

Harvest Date		Efficiency (%)
110 Days	:	57.4
120 days	:	47.7
125 days	:	39.7
130 days	:	55.4
140 days	:	47.4
Mean	:	50.5

The reproductive efficiency of these peanuts was somewhat lower than the reproductive efficiency of 63.5 per cent reported by Smith (18). The data are summarized in Appendix Table XIII.

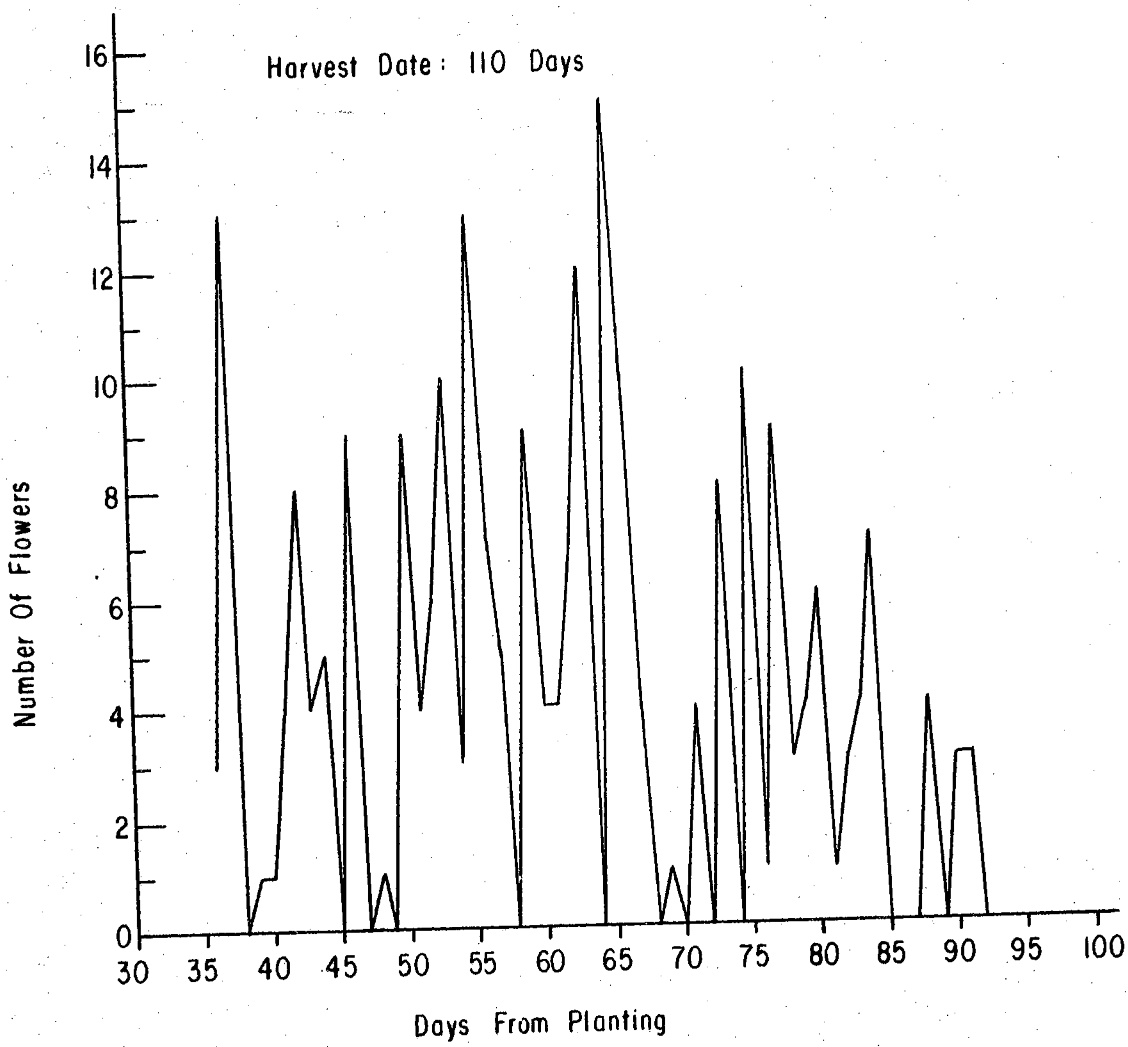

Figure 11. Number of Blooms for the September 13 Harvest Date, Stillwater, 1965.

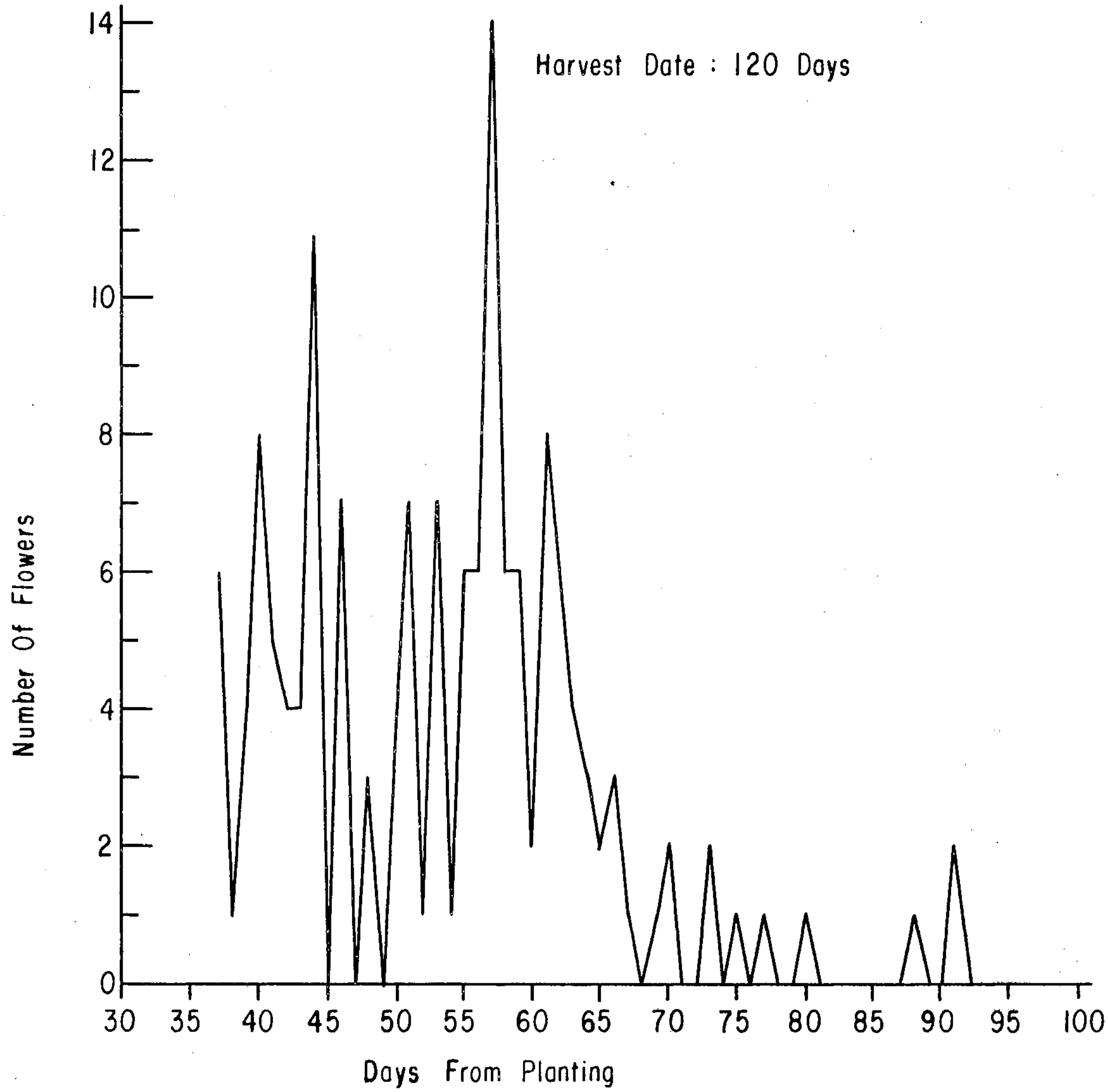

Figure 12. Number of Blooms for the September 23 Harvest Date, Stillwater, 1965.

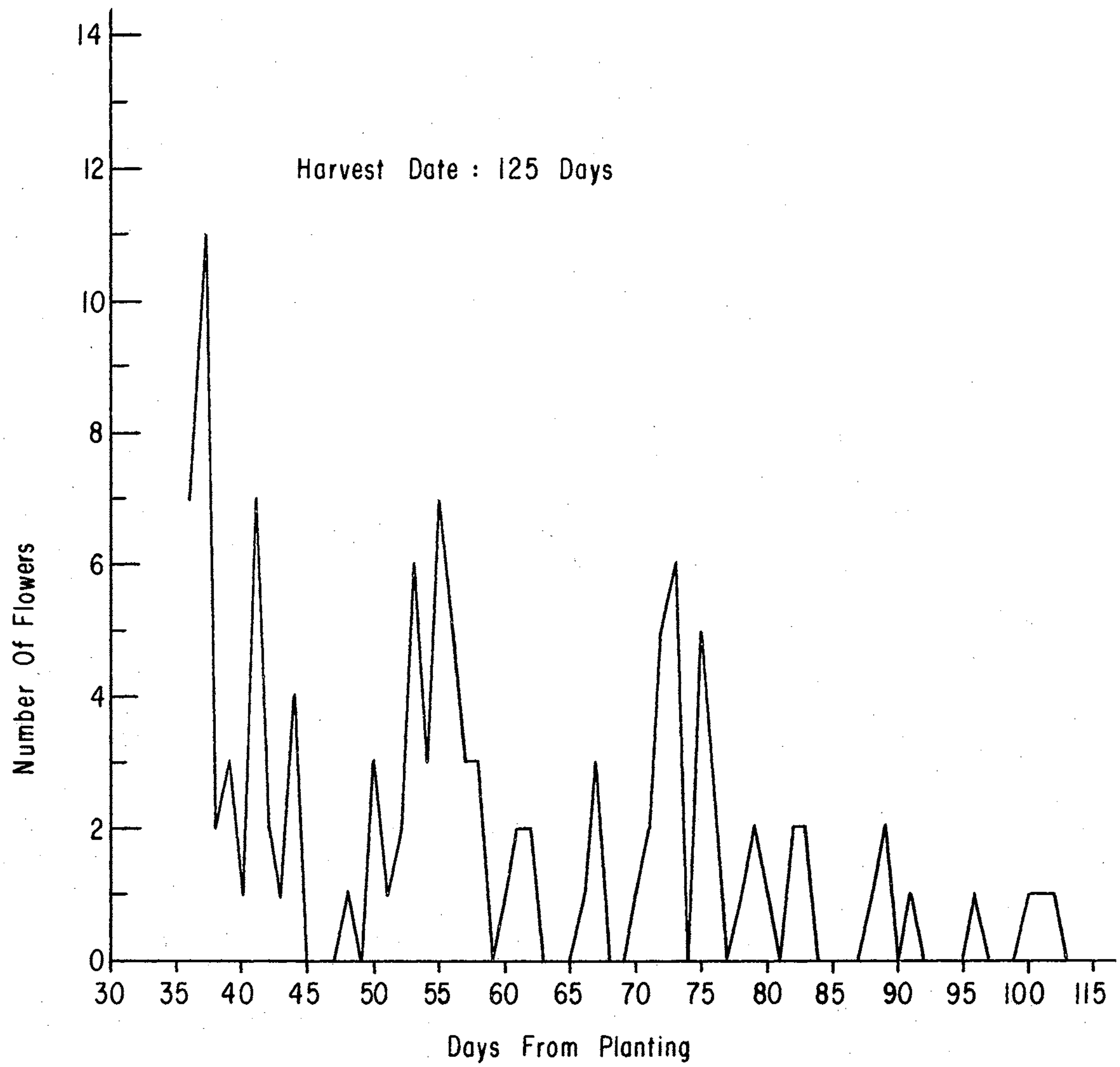

Figure 13. Number of Blooms for the September 28 Harvest Date, Stillwater, 1965.

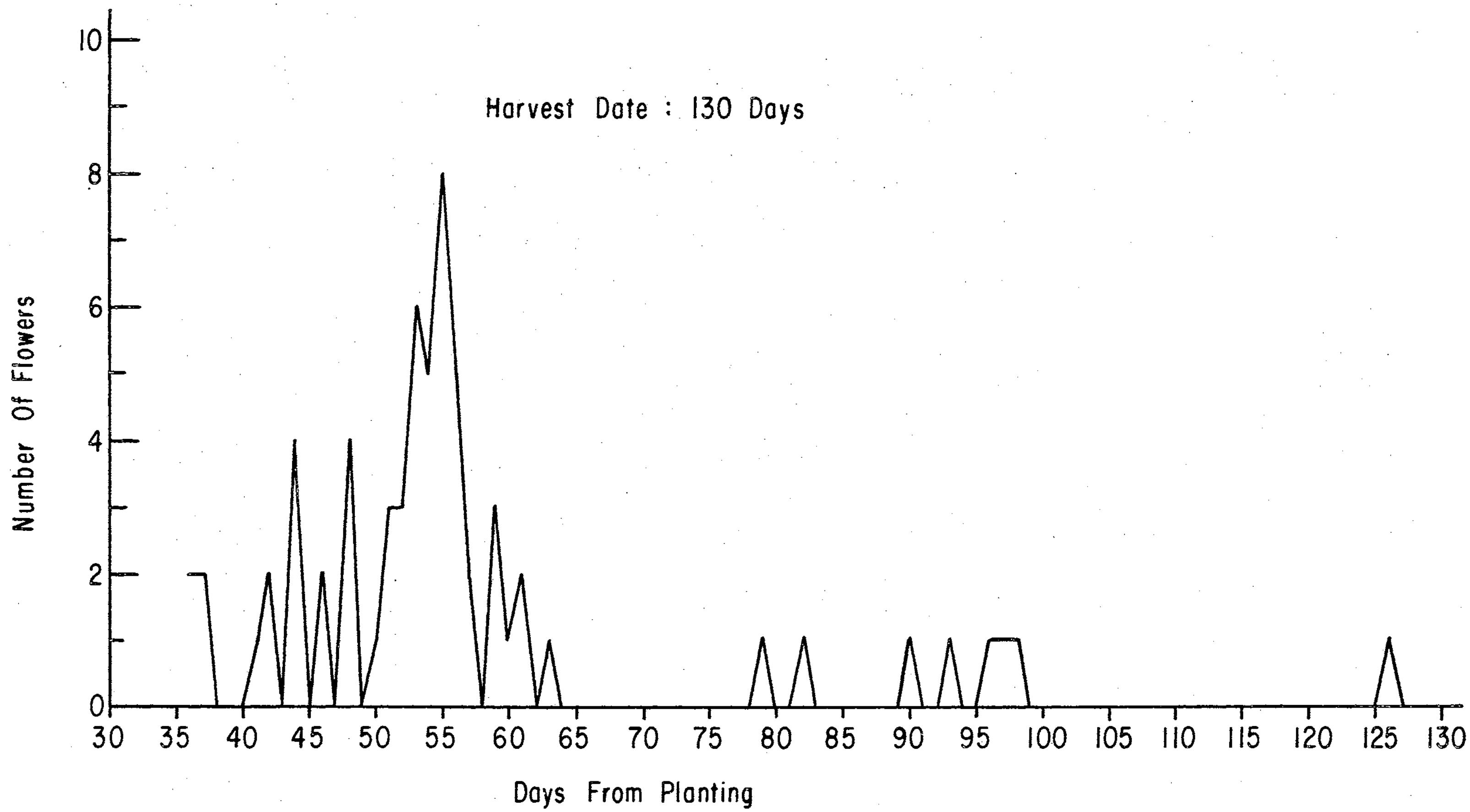

Figure 14. Number of Blooms for the October 3 Harvest Date, Stillwater, 1965.

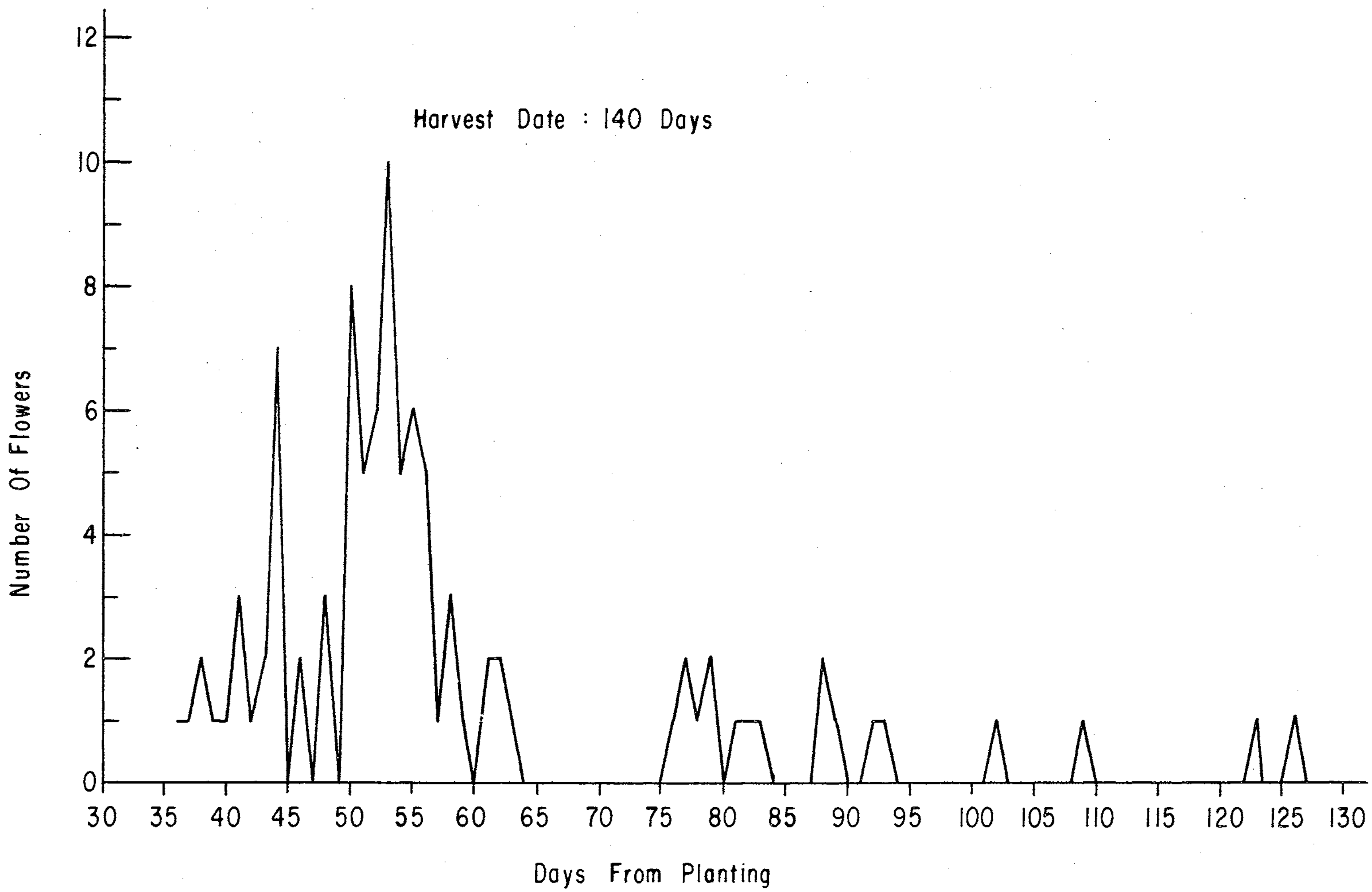

Figure 15. Number of Blooms for the October 13 Harvest Date, Stillwater, 1965.

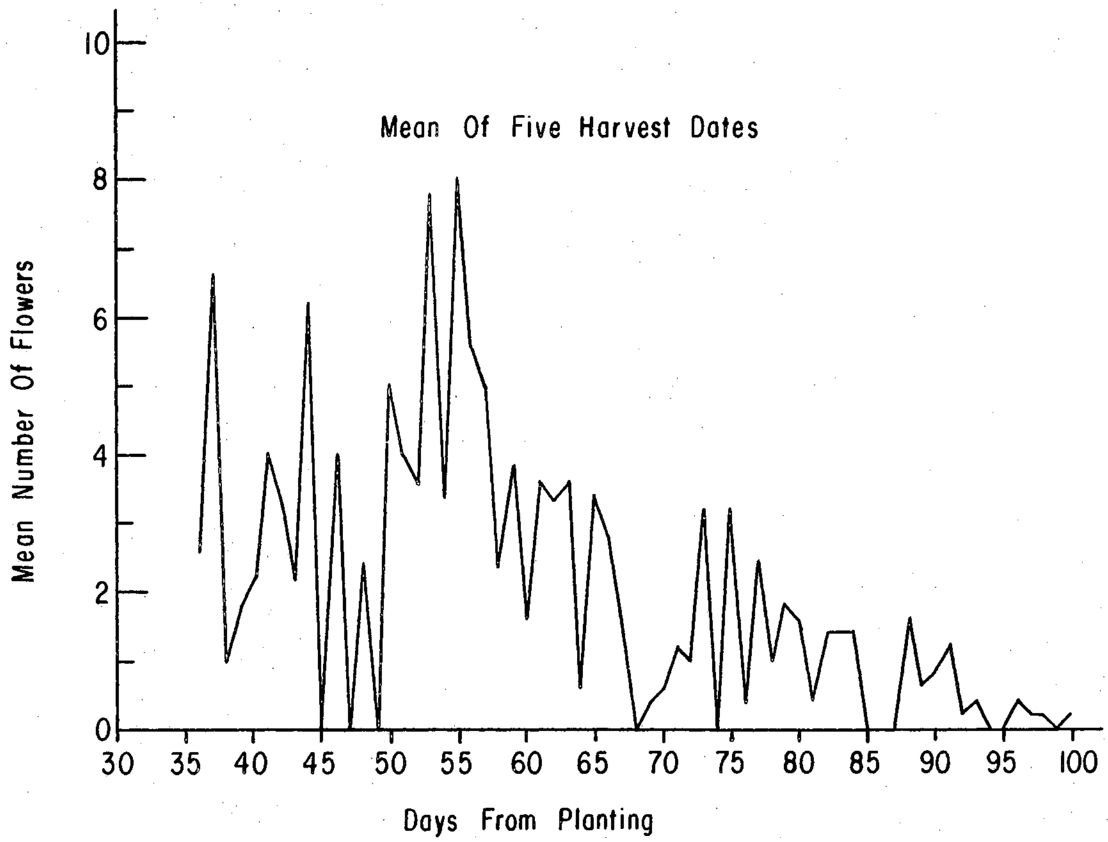

Figure 16. Mean Number of Blooms for Five Different Harvest Dates, Stillwater, 1965.

CHAPTER V

SUMMARY AND CONCLUSIONS

The Dixie Spanish variety of peanut was grown at Stratford and Stillwater during 1965. Data obtained in the Stratford study included yield, dry weight, number of fruit, number and weight of kernels, and various grade factors. Bloom data from Stillwater were utilized to determine the blooming cycle in the growth chamber.

Yield increased throughout the harvesting period, and the analysis of variance and LSD indicated that the last harvest date was significantly higher in mean yields than the previous dates.

The statistical analysis of the data indicated no significant differences for either the mean fruit or plant dry matter weights among the six dates.

The mean individual kernel weight reached a certain level and remained constant, thereby denoting the proper time to harvest, according to Barrs (1). In this study the mean individual kernel weight did remain constant at 0.34 grams for the first three harvest dates, when averaged for all of the maturity classes, then increased to 0.37 and 0.38 grams during the final three harvest dates. The mean yield, dry matter, and maturity classification indicated that the crop was not mature on October 15, however. On October 15, 44.4 per cent of the fruit on a plant was classified as immature. The MIKW was highest for the kernels from the mature fruit on October 8 and highest for the kernels from the intermediate and immature on the last sampling date, October 15.

A significant difference among harvest dates was noted for the mean number of fruit classified as intermediate. The mean number of mature and immature fruit per plant was not significantly different among the harvest dates. The mean number of mature fruit rose through the September 24 harvest date and then declined, while the immature fruit declined through September 24 and remained relatively constant. The mean number of intermediate fruit rose throughout the thirty-five day harvesting period.

The lines on the graphs for the mean number and weight of mature, intermediate, and immature kernels generally paralleled those for the number of fruit.

The analysis of variance showed a significant difference for the mean percentages of SMK and SS.

The mean percentage of SMK increased with each of the first five harvests before declining slightly on the last harvest date. The mean percentage of SS declined and then increased to a constant level on October 1.

The mean percentage of kernels obtained increased until October 1, then remained constant for the remainder of the study. These data were not analyzed statistically.

The bloom cycle in the growth chamber study showed an alternating high and low daily flowering frequency during most of the flowering period. The mean number of days from planting to first bloom was about thirty-three days, and the flowering period lasted for sixty days. The greatest number of blooms was recorded fifty-five days after planting.

Mean yield, dry matter content, number of intermediate fruit and number and weight of kernels indicated that maximum yield had not been reached on the October 15 sampling date.

On the basis of the numbers of mature and immature fruit and the number and weight of the kernels, September 24 would have been the best time to harvest. Using the grade factors, SMK, SS, and OK, October 1 would have been the best harvest date.

The number of days required for the fruit to develop on a Spanish variety of peanuts was reported as approximately fifty-five days (18). The growth chamber study showed a maximum number of blooms on July 21 and would be expected to have attained maximum yield on September 15. The mean of 139 fruits per five plants on September 13 substantiated the above statement (Appendix Table XIII).

The influence of environmental factors on the maturation of peanuts and criteria for measuring maturity need to be investigated more extensively to understand more completely the influence of harvest date on yield, grade, and quality of peanuts.

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APPENDIX TABLE I

SUMMARY OF MEAN WEIGHTS OF PLANTS AND FRUITS, MEAN DRY MATTER CONTENT OF PLANTS AND FRUITS AND MEAN NUMBER OF FRUITS, STRATFORD, 1965

Date Sampled	No. of Days From Planting	Mean Dry Wt. (Gms)		Mean Dry Matter (%)		Mean No. Fruit Per Plant
		Plant	Fruit	Plant	Fruit	
9/10	111	106.4	37.6	19.2	13.0	48.0
9/17	118	86.7	53.4	13.7	18.4	39.9
9/24	125	91.1	51.3	21.0	17.7	41.4
10/1	132	87.5	44.9	16.7	15.5	41.1
10/8	139	80.1	47.9	12.8	16.5	38.3
10/15	146	102.9	55.1	16.6	19.0	56.0
Mean		92.4	48.4	16.7	16.7	44.2
CV (%)		41.0	49.1			63.0
$LSD_{.05}$		N.S.	N.S.			9.3

APPENDIX TABLE II

MEAN NUMBER OF FRUITS PER PLANT IN EACH MATURITY GROUP, PERCENTAGE OF FRUIT IN EACH MATURITY GROUP, AND THE MEAN INDIVIDUAL KERNEL WEIGHTS FOR TEN PLANTS HARVESTED AT WEEKLY INTERVALS, STRATFORD, 1965

Sampl-ing Date	Days After Plant-ing	Mean No. of Fruit Per Plant					Percentage of Fruit Per Maturity Group			MIKW		
		Mature	Inter-mediate	Imma-ture	Pops	Pegs	Mature	Inter-mediate	Imma-ture	Mature	Inter-mediate	Imma-ture
9/10	111	4.4	14.5	29.1	17.1	72.5	9.2	30.2	60.1	0.35	0.33	0.34
9/17	118	7.8	10.0	22.1	12.2	72.6	19.6	25.1	55.4	0.35	0.39	0.29
9/24	125	13.1	11.6	16.7	5.4	50.5	31.6	28.0	40.3	0.32	0.38	0.33
10/1	132	7.8	14.9	18.4	12.0	56.1	19.0	36.3	44.8	0.35	0.42	0.34
10/8	139	10.1	12.8	15.4	10.7	46.9	26.4	33.4	40.2	0.43	0.39	0.29
10/15	146	9.0	22.6	25.2	13.5	82.8	15.9	39.0	44.4	0.37	0.40	0.36
Mean		8.7	14.4	21.2	11.8	63.6	20.3	32.2	47.6	0.36	0.38	0.32
CV (%)		93.0	57.4	74.9	81.0	52.0						
$LSD_{.05}$		N.S.	2.9	N.S.	N.S.	32.9						

APPENDIX TABLE III

MEAN YIELD AND PERCENTAGES OF SOUND MATURE KERNELS, SOUND SPLITS, OTHER KERNELS AND DAMAGED KERNELS, MEAN SEED SIZE, PERCENTAGE TOTAL MEATS, AND MEAN INDIVIDUAL KERNEL WEIGHT, STRATFORD, 1965

Sampl-ing Date	No. of Days From Planting	Mean Yield (Lbs./A)	Mean Grade Results (%)				GMS/ 100 Seed	Mean Meats (%)	Mean MIKW
			SMK	SS	OK	Dmg.			
9/10	111	1275	65.5	4.5	6.0	0.0	45.8	71.5	0.34
9/17	118	1284	67.5	2.0	6.5	0.0	47.9	74.0	0.34
9/24	125	1447	71.0	2.5	5.5	0.0	46.2	76.5	0.34
10/1	132	1463	73.0	4.5	3.0	1.5	49.1	77.5	0.37
10/8	139	1365	73.5	4.5	3.5	1.0	50.6	77.5	0.37
10/15	146	2011	72.5	4.5	4.5	0.5	50.2	77.5	0.38
Mean		1474	70.5	3.8	4.8	0.5	48.3	75.8	0.36
CV (%)		20.9	2.2	15.6	18.6	116.6	6.0		
$LSD_{.05}$		407	6.7	2.5	N.S.	N.S.	N.S.		

APPENDIX TABLE IV

MEAN SQUARES FOR PEANUT YIELDS AT EACH OF SIX HARVEST DATES, STRATFORD, 1965

Source	D.F.	M.S.
Total	29	
Replication	4	21500.014
Harvest Date	5	377047.450*
Residual	20	95289.701
C.V. (%)		20.9
$LSD_{.05}$		407.2

*Exceeds 5% Level of Significance

APPENDIX TABLE V

MEAN SQUARES FOR NUMBER OF FRUIT AT EACH OF SIX HARVEST DATES, STRATFORD, 1965

Source	D.F.	M.S.
Total	179	
Replication	9	115.645
Harvest Date	5	162.623
Error a	45	204.781
Maturity Group	2	2330.550**
Date x Maturity	10	198.403*
Error b	108	86.273
C.V. (%)		63,0
$LSD_{.05}$		9.3

**Exceeds 1% Level of Significance
*Exceeds 5% Level of Significance

APPENDIX TABLE VI

MEAN SQUARES FOR TOTAL NUMBER OF KERNELS AT EACH OF SIX HARVEST DATES, STRATFORD, 1965

Source	D.F.	M.S.
Replication	9	144.551
Harvest Date	5	281.418
Error a	45	274.602
Maturity	2	285.917**
Days x Maturity	10	273.030*
Error b	108	117.610
Size	1	20823.996**
Days x Size	5	486.646**
Maturity x Size	2	926.675**
Days x Maturity x Size	10	184.131*
Error c	162	97.241
C.V. (%)		81.3
$LSD_{.05}$		4.68

*Exceeds 5% Level of Significance
**Exceeds 1% Level of Significance

APPENDIX TABLE VII

MEAN SQUARES FOR THE NUMBER OF MATURE, INTERMEDIATE, AND IMMATURE KERNELS AT EACH OF SIX HARVEST DATES, STRATFORD, 1965

Source	D.F.	Mean Squares		
		Mature	Intermediate	Immature
Total	119			
Replication	9	168.471	83.120	77.212
Harvest Date	5	118.788	294.460	414.228
Error a	45	85.296	101.516	333.188
Screen Size	1	5727.006**	13653.328**	3297.008**
Harvest Date x Size	5	115.509	252.334	487.068**
Error b	54	94.423	75.500	121.799
C.V. (%)		34.2	71.5	64.9
$LSD_{.05}$		4.46	3.79	4.90

**Exceeds 1% Level of Significance

APPENDIX TABLE VIII

MEAN SQUARES FOR TOTAL WEIGHT OF KERNELS AT EACH OF SIX HARVEST DATES, STRATFORD, 1965

Source	D.F.	M.S.
Replication	9	21.561
Harvest Date	5	35.873
Error a	45	28.662
Maturity	2	89.129**
Treatment x Maturity	10	20.046
Error b	108	12.126
Size	1	4120.287**
Treatment x Size	5	41.995*
Maturity x Size	2	93.611**
Treatment x Maturity x Size	10	13.885
Error c	162	14.415
C.V. (%)		96.1
$LSD_{.05}$		3.3

**Exceeds 1% Level of Significance
*Exceeds 5% Level of Significance

APPENDIX TABLE IX

MEAN SQUARES FOR WEIGHT OF MATURE, INTERMEDIATE, AND IMMATURE KERNELS AT EACH OF SIX HARVEST DATES, STRATFORD, 1965

Source	D.F.	Mean Squares		
		Mature	Intermediate	Immature
Total	119			
Replication	9	338807.124	110711.468	5.541
Harvest Date	5	196649.615	367273.554	19.573
Error a	45	177343.060	161673.638	18.077
Screen Size	1	10256219.587**	23246074.675**	957.279**
H. Date x Size	5	193470.323	342455.148*	16.173
Error b	54	198932.056	140919.054	9.349
C.V. (%)		134.2	71.5	64.9

**Exceeds 1% Level of Significance
*Exceeds 5% Level of Significance

APPENDIX TABLE X

MEAN SQUARES FOR SMK AND SS AT EACH OF SIX HARVEST DATES, STRATFORD, 1965

Source	D.F.	Mean Squares	
		SMK	SS
Total	11	10.818	1.477
Replication	1	0.0	0.750
Harvest Date	5	21.400*	2.750*
Error	5	2.400	0.350
C.V. (%)		2.2	15.6
$LSD_{.05}$		6.7	2.5

*Exceeds 5% Level of Significance

APPENDIX TABLE XI

MEAN NUMBER AND WEIGHT OF THE KERNELS FOR TEN PLANTS HARVESTED AT WEEKLY INTERVALS, STRATFORD, 1965

Sampl-ing Date	No. of Days From Planting	Mean No. of Kernels Held On 15/64-In. Sieve			Mean Weight of Kernels Held On 15/64-In. Sieve (Gms)		
		Mature	Intermediate	Immature	Mature	Intermediate	Immature
9/10	111	6.9	23.2	20.1	2.6	8.7	6.4
9/17	118	10.6	14.5	21.9	5.1	5.9	6.7
9/24	125	20.4	18.4	18.8	8.0	7.7	5.9
10/1	132	14.1	25.0	23.6	5.7	9.8	7.1
10/8	139	17.5	20.0	19.0	7.6	8.6	5.8
10/15	146	15.4	35.8	30.0	6.5	13.8	10.4
Mean		14.2	22.8	22.2	5.9	9.1	7.1

APPENDIX TABLE XII

MEAN NUMBER OF FRUITS PER PLANT, MEAN WEIGHTS OF PLANTS AND FRUIT, MEAN DRY MATTER CONTENT OF PLANTS AND FRUITS, MEAN PERCENTAGE OF FRUIT IN EACH MATURITY GROUP, NUMBER OF POPS AND PEGS IN GROWTH CHAMBER STUDY, STILLWATER, 1965

Sampl- ing Date	No. Days From Sampl.	Mean Dry Wt. (gms)		Mean Dry Matter (%)		Mean No. Fruit Per Plant			% of Fruit Per Maturity Group			Mean No. Fruit	Pops	Pegs
		Plant	Fruit	Plant	Fruit	Mat.	Int.	Imm.	Mat.	Int.	Imm.			
9/13	110	13.9	12.2	23.7	44.9	2.4	10.2	4.6	14.0	59.3	26.7	17.2	5.8	10.6
9/23	120	10.2	10.7	24.2	47.3	2.2	6.6	2.8	19.0	56.9	24.1	11.6	1.8	2.8
9/28	125	8.5	6.4	26.5	46.4	2.8	2.8	1.4	40.0	40.0	20.0	7.0	0.8	2.2
10/3	130	6.8	5.9	22.7	49.6	2.4	2.6	1.0	40.0	43.3	16.6	6.0	1.2	1.2
10/13	140	8.3	6.8	24.0	47.2	1.6	2.8	3.4	20.5	35.9	43.6	7.8	1.8	1.4
Mean		9.5	8.4	24.2	47.1	2.3	5.0	2.6	26.7	47.1	26.2	9.9	2.3	3.6

APPENDIX TABLE XIII

NUMBER OF BLOOMS, NUMBER OF FRUIT, NUMBER OF PEGS, AND REPRODUCTIVE EFFICIENCY FOR FIVE DIXIE SPANISH PEANUT PLANTS HARVESTED AT FIVE DIFFERENT DATES IN THE GROWTH CHAMBER STUDY, STILLWATER, 1965

Harvest Date	Days From Planting	No. of Blooms	No. of Fruit	No. of Pegs	Reproductive Efficiency (%)
9/13	110	242	139	53	57.4
9/23	120	151	72	14	47.7
9/28	125	116	46	11	39.7
10/3	130	65	36	6	55.4
10/13	140	97	46	7	47.4
Total		671	339	91	50.5

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