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I am submitting herewith a thesis written by Charlie Dallas Manning III entitled "Effect of Soybean Plant Density on Leaf Chlorophyll Content, Pod, and Seed Characteristics." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Plant and Soil Science.

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EFFECT OF SOYBEAN PLANT DENSITY ON LEAF CHLOROPHYLL CONTENT, POD, AND SEED CHARACTERISTICS

A Thesis

Presented for the

Master of Science

Degree

The University of Tennessee, Knoxville

Charlie Dallas Manning III

June 1979

1390012

ACKNOWLEDGMENTS

The author wishes to express his sincere gratitude and appreciation to the following people whose assistance made this research possible:

Dr. W. L. Parks, committee chairman, for his guidance, understanding, and friendship throughout this study.

Dr. R. J. Lewis and Dr. G. M. Lessman, committee members, for their constructive criticism, suggestions, and for serving as members of the author's graduate committee.

The Experiment Station for providing financial assistance to the author during the course of this study.

Dr. Lloyd Seatz for providing the necessary materials and equipment needed in this study.

My parents and my sister for their help, encouragement, and sacrifices they have made to make my education possible.

ABSTRACT

The Row Spacing Experiments

An investigation was conducted on Sequatchie loam to determine how yield components were affected by row spacings of both drilled and hill dropped soybeans. Essex, Forrest, York, and Mitchell soybeans were drilled in rows of 46, 61, 76, and 91 cm. Essex, Forrest, and York soybeans were hill dropped in 46 and 91 cm rows with four, three, and two plants per hill. The plots were sampled in the middle of October after the first frost. All pods were taken from the fan and upper branches, counted, hulled, and weighed.

Significant yield increases were observed for the soybeans drilled in narrow rows. As plants per hill increased in the hill dropped soybeans significant differences in yield were observed only for Essex. The hill dropped soybeans showed significant differences in yield as the row spacing was decreased from 91 to 46 cm in all varieties, except Forrest. The yield increase could be attributed to a decrease in the percentage of beans produced on the fan branches which produced beans of a smaller weight than the upper branches. The upper branches also produced a higher percentage of three bean pods.

The Chlorophyll Experiment

A study was performed on Sequatchie loam to determine the effects of plant density on the quantity of chlorophyll in the different trifoliates on soybean plants arranged in a nested experimental design. Essex, Forrest, York, and Bedford soybeans were grown in a equidistant

arrangement with a distance of 15 and 30 cm between hills and one, two, and three plants per hill. Trifoliate samples for chlorophyll determinations were taken from the plots when the plants were in the early bloom stage.

The results showed that the amount of chlorophyll varied with the height of trifoliate with the fourth trifoliate being the highest. Significant reduction in trifoliate chlorophyll content was also found as the plants per hill increased from one to two plants. No differences in chlorophyll content were found among the varieties or the distance between hills.

TABLE OF CONTENTS

CHAPTER		PAGE
I.	INTRODUCTION	1
II.	SELECTED LITERATURE REVIEW	2
III.	MATERIALS AND METHODS	6
	Plant Design and Layout of the Row Spacing Experiment	6
	Fan and Upper Branch Yield Distribution	7
	Plot Design and Layout of the Chlorophyll Experiment	8
	Sampling for Chlorophyll	8
	Chlorophyll Extraction	9
IV.	RESULTS AND DISCUSSION	11
	The Drilled Soybeans	11
	The Hill Dropped Soybeans	14
	Bean Distribution on the Fruiting Branches	19
	Yields	22
	Chlorophyll Content of the Trifoliates	22
V.	SUMMARY AND CONCLUSIONS	28
	The Row Spacing Experiment	28
	The Chlorophyll Experiment	28
SELECTED REFERENCES		30
APPENDICES		33
Appendix A		34
Appendix B		103
Appendix C		108
VITA		117

LIST OF TABLES

TABLE		PAGE
1.	Average Bean Weight, Pod, and Bean Distribution from the Different Fruiting Branches of Essex, Forrest, York, and Mitchell Soybeans Grown in Drilled Rows	12
2.	F-Values Calculated from Analyses of Variance of Four Drilled Varieties of Soybeans for Average Bean Weight, Average Number of Beans per Plant and Yield	15
3.	Average Bean Weight, Pod, and Bean Distribution from the Different Fruiting Branches of Essex, Forrest, and York Soybeans Grown in Hills	16
4.	Distribution of Soybean Seed on the Different Fruiting Branches of Essex, Forrest, York, and Mitchell Grown in 46, 61, 76, and 91 cm Drilled Rows	20
5.	Distribution of Soybean Seed on the Different Fruiting Branches of Essex, Forrest, and York Grown in 46 and 91 cm Rows with Four, Three, and Two Plants per Hill	21
6.	Soybean Yields for Essex, Forrest, York, and Mitchell Varieties Drilled in 46, 61, 76, and 91 cm Row Spacings . .	23
7.	Soybean Yields for Essex, Forrest, and York Varieties Hill Dropped in 46 and 91 cm Row Spacings	23
8.	Soybean Yields for Essex, Forrest, and York Varieties Hill Dropped at Four, Three, and Two Plants per Hill	24
9.	Milligrams of Chlorophyll per Gram of Trifoliate and Percent Chlorophyll in Trifoliates of Four Soybean Varieties	25
10.	Milligrams of Chlorophyll per Gram of Trifoliate and Percent Chlorophyll in Trifoliates of Soybeans at Different Trifoliate Heights	25
11.	Milligrams of Chlorophyll per Gram of Trifoliate and Percent Chlorophyll in Trifoliates of Soybeans at Three Different Plant Populations per Hill	26
12.	Milligrams of Chlorophyll per Gram of Trifoliate and Percent Chlorophyll in Trifoliates of Soybeans at Two Distances Between Hills	26

TABLE PAGE

13. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 46 cm Rows 35

14. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 46 cm Rows 36

15. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 61 cm Rows 37

16. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 61 cm Rows 38

17. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 76 cm Rows 39

18. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 76 cm Rows 40

19. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 91 cm Rows 41

20. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 91 cm Rows 42

21. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 46 cm Rows 43

22. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 46 cm Rows 44

23. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 61 cm Rows 45

24. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 61 cm Rows 46

25. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 76 cm Rows 47

26. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 76 cm Rows 48

TABLE PAGE

27. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 91 cm Rows 49

28. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 91 cm Rows 50

29. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 46 cm Rows 51

30. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 46 cm Rows 52

31. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 61 cm Rows 53

32. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 61 cm Rows 54

33. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 76 cm Rows 55

34. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 76 cm Rows 56

35. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 91 cm Rows 57

36. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 91 cm Rows 58

37. Pod and Bean Distribution on the Different Fruiting Branches of Mitchell Soybeans Grown in 46 cm Rows 59

38. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Mitchell Soybeans Grown in 46 cm Rows 60

39. Pod and Bean Distribution on the Different Fruiting Branches of Mitchell Soybeans Grown in 61 cm Rows 61

40. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Mitchell Soybeans Grown in 61 cm Rows 62

TABLE PAGE

41. Pod and Bean Distribution on the Different Fruiting Branches of Mitchell Soybeans Grown in 76 cm Rows 63

42. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Mitchell Soybeans Grown in 76 cm Rows 64

43. Pod and Bean Distribution on the Different Fruiting Branches of Mitchell Soybeans Grown in 91 cm Rows 65

44. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Mitchell Soybeans Grown in 91 cm Rows 66

45. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 46 cm Rows with Two Plants per Hill 67

46. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 46 cm Rows with Two Plants per Hill 68

47. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 46 cm Rows with Three Plants per Hill 69

48. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 46 cm Rows with Three Plants per Hill 70

49. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 46 cm Rows with Four Plants per Hill 71

50. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 46 cm Rows with Four Plants per Hill 72

51. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 91 cm Rows with Two Plants per Hill 73

52. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 91 cm Rows with Two Plants per Hill 74

TABLE PAGE

53. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 91 cm Rows with Three Plants per Hill 75

54. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 91 cm Rows with Three Plants per Hill 76

55. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 91 cm Rows with Four Plants per Hill 77

56. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 91 cm Rows with Four Plants per Hill 78

57. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 46 cm Rows with Two Plants per Hill 79

58. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 46 cm Rows with Two Plants per Hill 80

59. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 46 cm Rows with Three Plants per Hill 81

60. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 46 cm Rows with Three Plants per Hill 82

61. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 46 cm Rows with Four Plants per Hill 83

62. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 46 cm Rows with Four Plants per Hill 84

63. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 91 cm Rows with Two Plants per Hill 85

64. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 91 cm Rows with Two Plants per Hill 86

TABLE PAGE

65. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 91 cm Rows with Three Plants per Hill 87

66. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 91 cm Rows with Three Plants per Hill 88

67. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 91 cm Rows with Four Plants per Hill 89

68. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 91 cm Rows with Four Plants per Hill 90

69. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 46 cm Rows with Two Plants per Hill 91

70. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 46 cm Rows with Two Plants per Hill 92

71. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 46 cm Rows with Three Plants per Hill 93

72. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 46 cm Rows with Three Plants per Hill 94

73. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 46 cm Rows with Four Plants per Hill 95

74. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 46 cm Rows with Four Plants per Hill 96

75. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 91 cm Rows with Two Plants per Hill 97

76. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 91 cm Rows with Two Plants per Hill 98

TABLE PAGE

77. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 91 cm Rows with Three Plants per Hill 99

78. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 91 cm Rows with Three Plants per Hill 100

79. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 91 cm Rows with Four Plants per Hill 101

80. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 91 cm Rows with Four Plants per Hill 102

81. Essex Soybean Yields for 46, 61, 76, and 91 cm Drilled Row Spacings 104

82. Forrest Soybean Yields for 46, 61, 76, and 91 cm Drilled Row Spacings 104

83. York Soybean Yields for 46, 61, 76, and 91 cm Drilled Row Spacings 105

84. Mitchell Soybean Yields for 46, 61, 76, and 91 cm Drilled Row Spacings 105

85. Essex Soybean Yields for Four, Three, and Two Plants per Hill when Grown in 46 and 91 cm Rows 106

86. Forrest Soybean Yields for Four, Three, and Two Plants per Hill when Grown in 46 and 91 cm Rows 106

87. York Soybean Yields for Four, Three, and Two Plants per Hill when Grown in 46 and 91 cm Rows 107

88. Chlorophyll Content in Trifoliates of Essex Soybeans at Flower Initiation Time when Grown in Hills 15 cm Apart 109

89. Chlorophyll Content in Trifoliates of Essex Soybeans at Flower Initiation Time when Grown in Hills 30 cm Apart 110

90. Chlorophyll Content in Trifoliates of Forrest Soybeans at Flower Initiation Time when Grown in Hills 15 cm Apart 111

TABLE PAGE

91. Chlorophyll Content in Trifoliates of Forrest Soybeans at Flower Initiation Time when Grown in Hills 30 cm Apart 112

92. Chlorophyll Content in Trifoliates of York Soybeans at Flower Initiation Time when Grown in Hills 15 cm Apart 113

93. Chlorophyll Content in Trifoliates of York Soybeans at Flower Initiation Time when Grown in Hills 30 cm Apart . . . 114

94. Chlorophyll Content in Trifoliates of Bedford Soybeans at Flower Initiation Time when Grown in Hills 15 cm Apart . . . 115

95. Chlorophyll Content in Trifoliates of Bedford Soybeans at Flower Initiation Time when Grown in Hills 30 cm Apart . . . 116

CHAPTER I

INTRODUCTION

Numerous studies have been conducted in soybeans to determine the effect of various row spacings on yield components. Results of these studies have shown that individual beans produced on the fan branches weigh less than beans produced on the upper branches. Soybeans grown in narrow row spacing arrangements have shown significant yield increases over conventional row spacings. The study in 1977 evaluated how soybean weights and pod numbers from the different fruiting branches of both drilled and hill dropped soybeans were affected by row spacings. A second study, in 1978, evaluated the effects of plant spacings and hill populations on the quantity of chlorophyll in the different trifoliates on the soybean plant.

CHAPTER II

SELECTED LITERATURE REVIEW

Soybeans are an important agronomic crop in Tennessee. For this reason it is important to obtain maximum production from a given unit. There are several management practices that are necessary to produce optimum yields, such as fertilizers, pesticides, recommended varieties, plant populations, and row spacings (3).

In the past, the row spacings used by farmers were determined more by cultural practices than by any other factor. The rows had to be wide enough to allow space for cultivation. Since the advent of new and better herbicides, wider row spacings were no longer needed for cultivation (4).

Numerous workers have reported increased yields from narrow row soybeans (8, 10, 11, 12, 16). The yield increase varied with the seeding rate and variety (2). Wiggans (22) reported that six plants per square foot, regardless of the method of distribution, produced the highest yields of soybeans. Weber and Weiss (21) found that the optimum seeding rate for 32 inch row spacings was 1.4 bushels per acre in all five varieties tested. Probst (13) found that soybeans spaced two or three inches apart in 30 inch rows produced maximum yields. Lehman and Lambert (10) reported a significant yield increase in 20 inch rows over 40 inch rows. Weber, Shibles, and Byth (20) reported that maximum soybean yields were obtained with 10 inch row spacings at a plant population of 104,544 plants per acre. Total plant dry weight was

highest in five inch rows at a plant population of 209,088 plants per acre.

Increased yields from narrow rows vary depending upon the seeding rate and the variety. Basnet, Mader, and Nickel (2) reported highest yields from narrow rows (46 cm) with a 6.4 cm plant spacing within rows. The plants should be 5.1 cm apart within the row at maturity. The spacing within the row should change very little as the row width is decreased (8). Lueschen (11) reported that row spacings and seeding rate had no significant effect on seed yield. Weber and Weiss (21) found that the low seeding rates produced smaller yields.

The yields of soybeans differ among varieties for various populations. Johnson and Harris (9) reported maximum yield for all varieties, except Bragg, to be at 26.2 plants per meter (eight plants per foot). Wilcox (23) found that maximum yields of the most sensitive soybeans to high populations did not change significantly as the population was decreased or increased by 27 percent.

Row spacings and plant populations have been shown by a number of researchers to affect the yield components of soybeans (6, 9, 10, 11). Row spacings has caused some changes in the yield components of soybeans such as number of seed, seed weight, pod number, and seed per pod. Lehman and Lambert (10) reported that seed and pod numbers were affected more than seed weight and seed per pod. Wilcox (23) found that the mature plant weight, seed weight per plant, and the ratio of mature plant to seed weight increased as population decreased.

Probst (13) reported that spacing generally had little effect on seed size, but in some instances, he found the seeds in the narrow

spacings within the row slightly heavier. Johnson and Harris (9) found an inverse relationship between seed size and plant population for only one variety, Lee. The larger seeds of the other varieties were observed in wider spacings. Lehman and Lambert (10) found similar results, with one variety at one location showing an inverse relationship between seed size and plant population. Enyi (6) showed that increasing plant populations from 74 to 444 thousand plants per hectare produced a decrease in the number of pods per plant, and the bean weight from side branches. The proportion of dry matter accumulated in the pods and side branches decreased with increase in population, while the proportion accumulated in the main stem increased. However, no change was observed in seed weight, or the number of seeds per pod.

Shannon, Wilcox, and Probst (14, 15) evaluated the effects of varying numbers of plants per hill at different between-hill spacings on agronomic characteristics of two soybean varieties. The seed weight was found to differ significantly among varying plant numbers per hill at all spacings. There was a tendency for one variety (Harsoy 63) of plants at intermediate spacings to have the lightest seed in three-plant hills and heavier seed as plants per hill increased, conversely for Clark 63, three-plant hills had the heaviest seed and twelve-plant hills the lightest. Torrie (19) reported higher seed yields in the drilled rows than in the hill nurseries and the seed yields were also found to be higher in the fifteen-plant hills than the ten-plant hills.

Green coloring of plants is attributable primarily to chlorophyll a and b although several kinds of chlorophyll occur. There have not

been many published reports examining the amount of chlorophyll compared to other characteristics, such as yield. Sprague and Curtis (17) in 1929 found that chlorophyll grade or rating for hybrid corn was not significantly related to yield. They reported that the quantity of chlorophyll in inbred lines could be used as an index to the productivity of the F_1 hybrid. Fleming and Palmer (7) reported no significant correlation between total chlorophyll and yield per plant in corn.

Chlorophyll content has been shown to vary among soybean varieties (5). Soybean strains with similar green coloration may or may not contain the same kinds and quantities of chlorophyll (7). Starnes and Hadley (18) reported that the visual differences between the dark and light varieties of soybeans did not appear to be due to a difference in chlorophyll content.

CHAPTER III

MATERIALS AND METHODS

Two experiments were conducted on the Plant and Soil Science Field Laboratory in Knoxville, Tennessee. The first experiment, conducted in 1977, dealt with soybean weight and pod numbers on the fruiting branches at different row spacings. In 1978, a second experiment was undertaken to determine the variation of chlorophyll within the trifoliates of four soybean varieties grown at several plant densities.

Plant Design and Layout of the Row Spacing Experiment

The row spacing experiment consisted of both drilled and hill dropped soybeans. The drilled soybeans contained row spacings of 46, 61, 76, and 91 cm and included Essex, Forrest, York, and Mitchell varieties. The hill dropped soybeans included the Essex, Forrest, and York varieties in 46 and 91 cm rows with two, three, and four plants per hill. The treatments in the drilled and hill dropped soybeans were replicated five times.

The plots were planted on level Sequatchie loam and arranged in a randomized block design. The soil test results from the Tennessee Soil Testing Laboratory showed P and K tested medium with a pH of 6.1. Five hundred and sixty kilograms per hectare of 0-20-20 fertilizer was applied to all plots. Weeds were controlled by the application of Treflan at a rate of 0.84 kg per hectare disked into the soil before planting. The planting of the drilled plots was accomplished by means

of Planet Jr. planters, while the hill dropped plots were planted with jab type hand planters. Six to eight seeds were planted per hill, and thinned to the desired population after the plants had emerged. In the row spacing experiment, the sampling of both hill dropped and drilled soybeans was done in the middle of October after the plants had matured and dropped their leaves. Three samples of one plant each were taken from each drilled plot and the entire hill was collected from the hill dropped plots.

Fan and Upper Branch Yield Distribution

There are three types of fruiting branches found in the soybean plant; the basal branches, the fan branches, and the upper branches. The first branches on the soybean plant that are nearest the soil surface are the basal branches. They are usually large opposite branches that may intersect the main stem at a 90 degree angle. The fan branches occupy the seven or eight nodes above the basal branches. These branches are relatively large, alternately arranged on the main stem of the soybean plant. The upper branch consisted mainly of a terminal raceme which contained about six to ten nodes and in some cases a few small lateral branches. The pods from the fan and upper branches were removed and sorted by the number of beans per pod. In the samples, only two plants were found to have basal branches, and they were in 91 cm row spacing. The pods were counted, and the beans were shelled by hand. The beans were dried at 70°C before the weight of beans on each branch was determined. Average bean weight from the different branches was

determined by dividing total number of beans into the total bean weight for the branch.

Plot Design and Layout of the Chlorophyll Experiment

In 1978, chlorophyll was determined on the trifoliates of soybean plants grown when the distance between hills, populations per hill, and varieties were varied. Populations of one, two, and three plants per hill were used in hills planted at equidistant spacings of 15 and 30 cm. Essex, Forrest, York, and Bedford varieties were planted. The experimental design was nested. Two replications were used for the 15 and 30 cm spacings with two and three plants per hill, while only one replication was used for the 15 and 30 cm spacings with one plant per hill. Weed control, fertilization rate, pH value, P, and K level for the chlorophyll experiment were the same for the row spacing experiment. The soybeans were planted June 6, however it was necessary to replant the Essex and Forrest varieties on July 5, due to poor emergence caused by a heavy rain after planting.

The size of the plots was 2.74 meters square with equidistant spacings among hills. The seeds were planted by hand with a wooden peg to insure a close proximity of the seeds in the hill. Six to eight seeds were planted per hill and thinned later to the desired population after the plants had emerged.

Sampling for Chlorophyll

The sampling of the soybeans in the 1978 experiment was done at the early bloom stage. The samples were taken from the middle of the

plots to insure a representative sample. The trifoliates were removed from the stalk, and numbered according to treatment and the height on the stalk. The soybean leaf sample used in the analyses was a composite of three leaflets that make up the trifoliate. In some instances, the weight of one trifoliate was below the needed two gram sample, so two trifoliates from different plants at the same height were sampled for chlorophyll determination. Five samples from each treatment were taken for chlorophyll determination. The samples were placed in plastic bags and stored in a refrigerated room at a temperature of approximately 7°C (7).

Chlorophyll Extraction

The samples were removed from storage and a two gram fresh weight sample was taken for the extraction. Fifty ml, of 80 percent aqueous acetone was added to the two gram sample and macerated 10 minutes in a Waring blender. A small amount of $CaCO_3$ was used to neutralize the acidity and aid filtration. The leaf residue was separated from the chlorophyll extract by suction filtration. The filtrate was adjusted to a 100 ml volume with 80 percent aqueous acetone. Three subsamples of three ml were diluted with nine ml of 80 percent acetone. The chlorophyll concentration in the diluted subsamples was determined at two wave lengths, 645 and 663 mμ, on a Beckman Model B Spectrophotometer. A matched set of glass cuvets with a 1.0 cm light path was used in the Spectrophotometer. The readings were recorded in absorbance and converted to mg chlorophyll/ml by the following formula:

mg chlorophyll/ml = .0202 (Absorbance at 645 mμ) + .00802 (Absorbance at 663 mμ) (1, 7, 18). The mg chlorophyll/ml was converted to percent chlorophyll in the leaf tissue.

CHAPTER IV

RESULTS AND DISCUSSION

The Drilled Soybeans

Four varieties of soybeans were drilled in rows to determine the effect row spacings had on the average bean weight, the percent pods with one, two, three, or four beans, and the average number of beans produced by the fruiting branches. The basic data for bean yield and distribution on the fruiting branches are given in Appendices Tables 13 to 44. A summary of these results is presented in Table 1.

The average bean weight/plant per fruiting branch type tended to decrease for the fan branches as the row spacing was reduced. This relationship was not true for the upper fruiting branches where the opposite trend was observed in the Essex soybean. The average bean weight in the upper branches was greater than that for the fan branches. There was a considerable variation in average bean weight among varieties with Forrest being the smallest and York the largest.

The percent pods containing two beans were higher in the fan branches in all four varieties. The upper branches produced a higher percentage of pods with three beans than did the fan branches in all varieties, except York. The upper fruiting branch for all varieties, except York, had a smaller percentage of pods containing one bean. Mitchell had a larger percent of pods with three and four beans per pod than any other variety.

Table 1. Average Bean Weight, Pod, and Bean Distribution from the Different Fruiting Branches of Essex, Forrest, York, and Mitchell Soybeans Grown in Drilled Rows

Variety	Row Spacing	Average Bean Weight/Plant	Average Bean Weight	Pods With 1 Bean/Pod	2 Beans/Pod	3 Beans/Pod	4 Beans/Pod	Average Number of Beans/Plant
	cm	g	g	Percent				
			FAN BRANCH					
Essex	46	6.45	.130	17	75	8	0	49
Essex	61	9.49	.128	14	72	14	0	74
Essex	76	12.38	.120	12	66	22	0	105
Essex	91	14.57	.125	12	72	16	0	115
			UPPER BRANCH					
Essex	46	15.17	.142	10	66	24	0	107
Essex	61	14.63	.138	10	58	31	0	106
Essex	76	14.58	.131	10	63	27	0	112
Essex	91	13.98	.145	17	52	30	0	98
			FAN BRANCH					
Forrest	46	10.61	.116	12	67	21	0	91
Forrest	61	11.29	.116	11	61	28	0	91
Forrest	76	14.50	.115	12	61	27	0	125
Forrest	91	13.76	.116	15	55	30	0	119
			UPPER BRANCH					
Forrest	46	17.64	.127	13	56	32	0	139
Forrest	61	19.55	.135	11	55	34	0	143
Forrest	76	19.87	.127	11	54	34	0	154
Forrest	91	22.94	.134	11	51	38	0	171

Table 1. (continued)

Variety	Row Spacing	Average Bean Weight/Plant	Average Bean Weight	Pods With 1 Bean/Pod	Pods With 2 Beans/Pod	Pods With 3 Beans/Pod	Pods With 4 Beans/Pod	Average Number of Beans/Plant
	cm	g	g	Percent	Percent	Percent	Percent	
			FAN BRANCH					
York	46	11.57	.168	18	68	15	0	69
York	61	11.77	.166	16	67	27	0	70
York	76	17.58	.168	17	66	17	0	105
York	91	15.24	.160	15	68	17	0	96
			UPPER BRANCH					
York	46	15.58	.184	23	64	14	0	83
York	61	12.48	.181	19	67	14	0	71
York	76	16.19	.183	20	62	18	0	89
York	91	15.76	.178	24	59	17	0	89
			FAN BRANCH					
Mitchell	46	4.93	.129	13	50	38	0	38
Mitchell	61	7.63	.138	13	50	38	0	55
Mitchell	76	12.76	.121	11	49	40	0	103
Mitchell	91	18.12	.127	14	42	42	2	137
			UPPER BRANCH					
Mitchell	46	23.35	.154	5	36	54	5	151
Mitchell	61	24.05	.159	10	37	50	3	152
Mitchell	76	25.17	.154	8	37	57	3	164
Mitchell	91	23.13	.143	16	63	13	9	160

F-values calculated from analyses of variance (Table 2) indicate highly significant differences in yield at the different row spacings for each variety. No significant differences in average bean weight or average number of beans per plant were observed but average bean weight was found to vary highly significantly in replications x row spacings interaction for all varieties except Essex.

The Hill Dropped Soybeans

Three varieties of soybeans were planted in two row spacings at three plant populations per hill. A summary of the results from the hill dropped soybeans are presented in Table 3, with results for all samples collected shown in Appendices Tables 45 to 80. The analysis of variance was not done on the hill dropped soybeans because one hill per plot was sampled and this constituted an unequal number of individual plant samples for each unit.

The summary of the data in Table 3 shows the average bean weight on the fan branches to be less than the beans on the upper branches. The average bean weight/plant for the different fruiting branches decreased as the plants per hill increased in all varieties, except for the fan branches of York and Forrest at the 46 cm row spacing. When the width of the row spacings was decreased the average bean weight/plant decreased.

The number of beans per plant decreased as the plant population per hill increased, with the exception of the 46 cm spacing for Forrest (Table 3). The number of beans produced per plant depends to a great

Table 2. F-Values Calculated from Analyses of Variance of Four Drilled Varieties of Soybeans for Average Bean Weight, Average Number of Beans per Plant and Yield

		F-Values											
		Essex			Forrest			York			Mitchell		
Source	D. F.	Av. Bean Weight	Av. No. Beans/ Plant	Yield	Av. Bean Weight	Av. No. Beans/ Plant	Yield	Av. Bean Weight	Av. No. Beans/ Plant	Yield	Av. Bean Weight	Av. No. Beans Plant	Yield
Row Spacings	3	.17	1.68	28.38**	.30	.88	10.92**	1.50	2.53	9.31**	1.42	2.17	13.44**
Replication	4	.24	.54	5.14*	.45	.38	.92	.40	.45	1.28	.79	.28	.84
Replication X Row Spacings	12	1.84	1.69		5.86**	.51		13.66**	.89		36.66**	7.77*	
Samples	40	.43	1.07		.44	.17		.67	8.48		.54	.14	
Branches	60												

*Indicates Significances at the .01 level of Probability.

**Indicates Significances at the .05 level of Probability.

Table 3. Average Bean Weight, Pod, and Bean Distribution from the Different Fruiting Branches of Essex, Forrest, and York Soybeans Grown in Hills

Variety	Row Spacing	Plants per Hill	Average Bean Weight/Plant	Average Bean Weight	Pods With 1 Bean/Pod	Pods With 2 Beans/Pod	Pods With 3 Beans/Pod	Average Number of Beans/Plant
	cm		g	g	--Percent--			
				FAN BRANCH				
Essex	46	2	6.28	.110	14	72	14	57
Essex	46	3	5.39	.119	14	67	19	45
Essex	46	4	5.20	.130	11	74	16	40
				UPPER BRANCH				
Essex	46	2	11.50	.134	8	68	25	86
Essex	46	3	10.79	.136	16	62	24	78
Essex	46	4	8.27	.135	13	67	20	60
				FAN BRANCH				
Essex	91	2	21.60	.124	11	68	21	176
Essex	91	3	10.44	.116	10	71	19	87
Essex	91	4	7.41	.113	13	73	14	65
				UPPER BRANCH				
Essex	91	2	13.48	.141	11	60	29	96
Essex	91	3	12.63	.137	7	62	31	93
Essex	91	4	10.26	.131	13	61	26	79

Table 3 (continued)

Variety	Row Spacing	Plants per Hill	Average Bean Weight/Plant	Average Bean Weight	Pods with 1 Bean/Pod	Pods with 2 Beans/Pod	Pods with 3 Beans/Pod	Average Number of Beans/Plant
	cm		g	g	--Percent--			
				FAN BRANCH				
Forrest	46	2	7.03	.117	14	61	25	59
Forrest	46	3	4.63	.117	16	63	21	39
Forrest	46	4	7.81	.109	12	64	24	69
				UPPER BRANCH				
Forrest	46	2	15.22	.128	9	51	40	120
Forrest	46	3	10.79	.133	9	57	34	81
Forrest	46	4	7.40	.121	17	55	28	59
				FAN BRANCH				
Forrest	91	2	22.65	.128	9	57	34	173
Forrest	91	3	10.91	.122	19	53	28	88
Forrest	91	4	6.52	.099	7	60	33	66
				UPPER BRANCH				
Forrest	91	2	18.75	.134	8	44	48	140
Forrest	91	3	15.78	.137	14	43	43	115
Forrest	91	4	12.22	.119	19	47	44	101

Table 3 (continued)

Variety	Row Spacing	Plants per Hill	Average Bean Weight/Plant	Average Bean Weight	Pods with 1 Bean/Pod	Pods with 2 Beans/Pod	Pods with 3 Beans/Pod	Average Number of Beans/Plant
	cm		g	g	---Percent--			
				FAN BRANCH				
York	46	2	7.49	.168	14	68	18	44
York	46	3	7.50	.157	17	71	12	46
York	46	4	5.99	.166	26	68	5	36
				UPPER BRANCH				
York	46	2	13.13	.179	24	55	21	73
York	46	3	10.01	.157	22	56	22	63
York	46	4	8.77	.181	23	62	15	48
				FAN BRANCH				
York	91	2	15.77	.155	17	65	17	102
York	91	3	8.81	.153	17	66	17	57
York	91	4	6.95	.158	14	73	14	45
				UPPER BRANCH				
York	91	2	13.08	.168	13	61	26	80
York	91	3	13.62	.190	17	63	20	71
York	91	4	10.34	.174	20	60	20	58

degree on the number of beans per pod. The percentage of pods containing two beans was higher for the fan than the upper branches. A higher percentage of three bean pods was produced on the upper branches. The 91 cm row spacing had a higher percentage of pods containing three beans and a lower percentage of pods containing two beans than the 41 cm row spacing.

Bean Distribution on the Fruiting Branches

When soybeans were planted in high populations or in narrow row spacings, the percentage of beans produced on the basal and fan branches was reduced. The basal branches were eliminated in the 46, 61, and 76 cm spacings with only two plants in the 91 cm spacing containing basal branches. The data in Table 4 shows the percentage of soybeans produced on the upper branches increased as the row width decreased in the four varieties tested. The extent of the change varied with the variety of soybeans. The Mitchell soybeans had the greatest increase in the number of beans produced on the upper branches when the row spacing width was reduced.

Table 5 shows the percent distribution of soybean seed on the different fruiting branches of the hill dropped soybeans. The percent of soybeans produced on the upper fruiting branches in the 91 cm row spacing increased as the population per hill increased in all three varieties. The narrow row spacings (46 cm) produced a higher percentage of soybean seed on the upper branches than on the fan branches.

Table 4. Distribution of Soybean Seed on the Different Fruiting Branches of Essex, Forrest, York, and Mitchell Grown in 46, 61, 76, and 91 cm Drilled Rows

Row Spacing	Fan Branches	Variety	Upper Branches
cm	Percent		Percent
46	31	Essex	69
61	41	Essex	59
76	48	Essex	52
91	54	Essex	46
46	40	Forrest	60
61	39	Forrest	61
76	45	Forrest	55
91	41	Forrest	59
46	45	York	55
61	50	York	50
76	54	York	46
91	52	York	48
46	20	Mitchell	80
61	27	Mitchell	73
76	39	Mitchell	61
91	46	Mitchell	54

Table 5. Distribution of Soybean Seed on the Different Fruiting Branches of Essex, Forrest, and York Grown in 46 and 91 cm Rows with Four, Three, and Two Plants per Hill

Row Spacing	Plants per Hill	Variety	Fan Branches	Upper Branches
cm			Percent	Percent
46	4	Essex	25	75
46	3	Essex	35	65
46	2	Essex	40	60
	Average		33	67
91	4	Essex	45	55
91	3	Essex	48	52
91	2	Essex	65	35
	Average		53	47
46	4	Forrest	48	52
46	3	Forrest	32	68
46	2	Forrest	33	67
	Average		38	62
91	4	Forrest	31	69
91	3	Forrest	42	58
91	2	Forrest	56	44
	Average		43	57
46	4	York	43	57
46	3	York	45	55
46	2	York	38	62
	Average		42	58
91	4	York	39	61
91	3	York	46	54
91	2	York	57	43
	Average		47	53

Yields

The yield for the different varieties of drilled and hill dropped soybeans are in Appendices Tables 81 to 87, but summaries of these yields are presented in Tables 6, 7, and 8. The results in Table 6 show soybean yields in the 46 cm rows to be significantly higher than the yields at all other row spacings for all four varieties, except for the yield of Essex in 61 cm rows. In the Forrest and Mitchell varieties, yields in 91 cm rows were significantly lower than yields in 76 cm rows.

In the hill-drop soybeans (Table 7), the yields of both Essex and York varieties were significantly higher in 46 cm rows while the yields of Forrest in 46 and 91 cm rows were not significantly different. No significant differences were observed in the yield of Forrest and York varieties (Table 8) where hills contained 2, 3, or 4 plants. Essex soybeans, having only two plants per hill showed a significant decrease in yield.

Chlorophyll Content of the Trifoliates

The results from the determination of chlorophyll content of each trifoliate in four varieties of soybeans at two different row spacings, and three populations per hill are presented in Appendices Tables 88 to 95 and summarized in Tables 9 to 12. The data in the tables are expressed in both mg of chlorophyll per gram of trifoliate and percent of chlorophyll in the trifoliate.

Some researchers (1, 18) have shown certain varieties of soybeans to differ significantly in their chlorophyll content. The quantity of

Table 6. Soybean Yields for Essex, Forrest, York, and Mitchell Varieties Drilled in 46, 61, 76, and 91 cm Row Spacings

Row Spacing	Variety			
	Essex	Forrest	York	Mitchell
cm	kg/ha			
46	4523 a*	4402 a	4166 a	3898 a
61	4187 a	3380 b	3306 b	3562 b
76	3622 b	2923 bc	3441 b	3360 b
91	3071 b	2628 c	3300 b	3300 b

*Means followed by the same letter are not different at the .05 level of significance according to the Duncan's New Multiple Range Test.

Table 7. Soybean Yields for Essex, Forrest, and York Varieties Hill Dropped in 46 and 91 cm Row Spacings

Row Spacing	Variety		
	Essex	Forrest	York
cm	kg/ha		
46	5139 a*	3797 a	4655 a
91	3777 b	3537 a	3573 b

*Means followed by the same letter are not different at the .05 level of significance according to the Duncan's New Multiple Range Test.

Table 8. Soybean Yields for Essex, Forrest, and York Varieties Hill Dropped at Four, Three, and Two Plants per Hill

Plants/Hill	Variety		
	Essex	Forrest	York
	kg/ha		
4	4681 a*	3726 a	4025 a
3	4533 ab	3639 a	4173 a
2	4160 b	3636 a	4143 a

*Means followed by the same letter are not different at the .05 level of significance according to the Duncan's New Multiple Range Test.

Table 9. Milligrams of Chlorophyll per Gram of Trifoliate and Percent Chlorophyll in Trifoliates of Four Soybean Varieties

Varieties	Trifoliate Chlorophyll Content	
	mg/g	Percent
Essex	.95 a*	.095
Bedford	.78 a	.078
York	.70 a	.070
Forrest	.68 a	.068

*Means followed by the same letter are not different at the .05 level of significance according to the Duncan's New Multiple Range Test.

Table 10. Milligrams of Chlorophyll per Gram of Trifoliate and Percent Chlorophyll in Trifoliates of Soybeans at Different Trifoliate Heights

Trifoliate/Height		Trifoliate Chlorophyll Content	
		mg/g	Percent
4		.87 a*	.087
3		.85 b	.085
5		.84 b	.085
2		.82 c	.082
6		.69 d	.069
1	(lowest)	.64 e	.064
7	(highest)	.45 f	.045

*Means followed by the same letter are not different at the .05 level of significance according to the Duncan's New Multiple Range Test.

Table 11. Milligrams of Chlorophyll per Gram of Trifoliate and Percent Chlorophyll in Trifoliates of Soybeans at Three Different Plant Populations per Hill

Plants/Hill	Trifoliate Chlorophyll Content	
	mg/g	Percent
1	.85 a*	.085
2	.77 b	.077
3	.74 b	.074

*Means followed by the same letter are not different at the .05 level of significance according to the Duncan's New Multiple Range Test.

Table 12. Milligrams of Chlorophyll per Gram of Trifoliate and Percent Chlorophyll in Trifoliates of Soybeans at Two Distances between Hills

Distance between Hills	Trifoliate Chlorophyll Content	
cm	mg/g	Percent
15	.79 a*	.079
30	.78 a	.078

*Means followed by the same letter are not different at the .05 level of significance according to the Duncan's New Multiple Range Test.

chlorophyll in the trifoliates of four soybean varieties are presented in Table 9. The range of chlorophyll for the four varieties was from a high of .095 percent for Essex to a low of .068 percent for Forrest. However, in this study the differences in the chlorophyll content among the four varieties were not significant.

The trifoliate height on the soybean plant was found to significantly influence the quantity of chlorophyll present in the trifoliate as shown in Table 10. The fourth trifoliate from the bottom was found to contain the highest quantity of chlorophyll and trifoliate chlorophyll content decreased up and down the plants from this point. The upper trifoliates on the plant was found to have the lowest chlorophyll content. The trifoliate apparently had not had sufficient time to mature. The lowest trifoliate on the plants had the second smallest percent chlorophyll.

The number of soybean plants per hill was found to affect the chlorophyll content in the trifoliate. The data in Table 11 shows that the percent chlorophyll in the trifoliate decreased as the plants per hill increased. Chlorophyll in plants with a population of one plant per hill was found to be significantly higher than that for two or three plants per hill. No significant differences were found as the plants per hill were increased from two to three.

When the distance between hills was increased from 15 to 30 cm, no significant difference in trifoliate chlorophyll content was found (Table 12). These data indicate that the competition among plants in hills influenced the chlorophyll content of the plants while plants 15 cm or further away had little effect on the chlorophyll content of the plant.

CHAPTER V

SUMMARY AND CONCLUSIONS

The Row Spacing Experiment

An investigation was completed on bean distribution within plants for four varieties of soybeans that were drilled and three varieties that were hill dropped. Four row spacings (46, 61, 76, and 91 cm) were used for the drilled beans and two row spacings (46 and 91 cm), with four, three, and two plants per hill for the hill dropped soybeans. The beans and pods were removed from the different fruiting branches, counted, and weighed. The results showed that the beans from the fan branches weighed less than beans from the upper branches and that the narrow row spacing produced a higher percentage of beans on upper branches than the fan branches, while the reverse was true for the wide row spacings. Since a higher percentage of beans from the narrow rows was produced on the upper branches, the yields in most cases were higher in the narrow row spacings than the wider row spacings.

The Chlorophyll Experiment

Four varieties of soybeans were planted in hills at two equidistant spacings of 15 and 30 cm with one, two, and three plants per hill. Enough plants to provide a two gram normal leaf sample of each trifoliate was taken from each plot at early bloom stage to determine the trifoliate chlorophyll content. The results showed that the chlorophyll content of the trifoliate heights on the soybean plant differed significantly.

Increasing the plant population per hill was found to significantly decrease the trifoliate chlorophyll content. No significant differences among varieties and between hill spacings of 15 and 30 cm were found.

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APPENDICES

APPENDIX A

Table 13. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 46 cm Rows

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
			Beans/Pod					Beans/Pod			
	1	6	39	12	0	120	3	28	3	0	68
1	2	6	52	11	0	143	3	34	7	0	92
	3	8	37	12	0	118	....		Missing	....	
	1	3	29	17	0	112	3	19	2	0	47
2	2	2	31	12	0	100	2	24	2	0	56
	3	3	25	14	0	95	1	8	1	0	20
	1	8	38	9	0	111	5	16	6	0	55
3	2	6	44	11	0	127	6	36	6	0	96
	3	7	41	12	0	125	2	25	7	0	73
	1	3	18	9	0	66	2	16	1	0	37
4	2	4	20	14	0	86	1	4	0	0	9
	3	10	25	4	0	72	1	2	2	0	11
	1	3	38	16	0	127	1	23	6	0	65
5	2	3	23	12	0	85	2	5	4	0	24
	3	2	33	15	0	113	1	9	3	0	28
Average		5	33	12	0	107	2	18	4	0	49

Table 14. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 46 cm Rows

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
1	1	13.19	120	.110	7.02	68	.103
	2	20.30	143	.142	13.58	92	.148
	3	18.43	118	.156	....	Missing	....
2	1	13.79	112	.123	5.42	47	.115
	2	15.07	100	.151	8.33	56	.149
	3	12.46	95	.131	2.19	20	.110
3	1	17.53	111	.158	7.10	55	.129
	2	19.70	127	.155	13.49	96	.141
	3	17.85	125	.143	9.95	73	.136
4	1	8.70	66	.132	5.02	37	.136
	2	11.33	86	.132	1.04	9	.115
	3	8.77	72	.122	1.36	11	.124
5	1	18.55	127	.146	8.58	65	.132
	2	14.74	85	.174	3.69	24	.154
	3	17.20	113	.152	3.51	28	.125
Average		15.17	107	.142	6.45	49	.130

Table 15. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 61 cm Rows

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1 Bean/Pod	2 Beans/Pod	3 Beans/Pod	4 Beans/Pod	Beans/ Plant	1 Bean/Pod	2 Beans/Pod	3 Beans/Pod	4 Beans/Pod	Beans/ Plant
	1	6	28	14	0	104	4	26	2	0	62
1	2	5	22	13	0	88	6	20	1	0	49
	3	8	39	18	2	148	3	16	2	0	41
	1	8	29	8	0	90	4	21	6	0	64
2	2	1	24	20	0	109	6	14	3	0	43
	3	6	34	19	0	131	22	37	8	0	120
	1	7	26	13	1	102	1	16	1	0	36
3	2	2	31	15	0	109	7	56	4	0	131
	3	6	39	23	0	153	3	30	6	0	81
	1	5	25	15	0	100	4	19	7	0	63
4	2	8	23	12	1	94	1	29	7	0	80
	3	2	20	13	0	81	11	42	9	0	122
	1	2	24	11	0	83	2	16	10	0	64
5	2	3	28	15	0	104	2	16	6	0	52
	3		....	Missing	....		1	36	11	0	106
Average		5	28	15	0	106	5	26	5	0	74

Table 16. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 61 cm Rows

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
1	1	15.99	104	.154	8.79	62	.142
	2	12.09	88	.137	6.29	49	.128
	3	21.52	148	.145	5.79	41	.141
2	1	12.65	90	.141	8.55	64	.134
	2	15.10	109	.139	5.47	43	.127
	3	17.60	131	.134	15.44	120	.129
3	1	13.88	102	.136	4.15	36	.115
	2	12.99	109	.119	16.65	131	.127
	3	22.42	153	.147	10.88	81	.134
4	1	13.58	100	.136	8.13	63	.129
	2	13.42	94	.143	10.46	80	.131
	3	13.03	81	.161	17.19	122	.141
5	1	11.81	83	.143	6.06	64	.095
	2	11.64	104	.112	6.65	52	.128
	3	....	Missing		11.90	106	.112
Average		14.63	106	.138	9.49	74	.128

Table 17. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 76 cm Rows

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	11	28	18	0	121	5	19	3	0	52
1	2	6	33	20	0	132	7	42	15	0	136
	3	5	24	16	0	101	2	15	0	0	32
	1	4	34	13	0	111	8	43	11	0	127
2	2	2	32	6	0	84	1	26	3	0	62
	3	3	38	6	0	97	5	8	2	0	27
	1	2	28	12	0	94	15	83	52	0	337
3	2	9	35	14	0	121	11	43	17	0	148
	3	7	30	20	0	127	9	15	6	0	57
	1	4	22	10	0	78	3	22	6	0	65
4	2	7	32	11	0	104	2	36	9	0	101
	3	13	45	13	0	142	8	63	19	0	191
	1	4	29	11	0	95	1	11	0	0	23
5	2	3	25	28	0	137	10	45	10	0	130
	3	1	38	20	0	137	3	29	9	0	88
Average		5	32	14	0	112	6	33	11	0	105

Table 18. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 76 cm Rows

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	17.44	121	.144	6.95	52	.134
1	2	19.51	132	.148	14.28	136	.105
	3	11.24	101	.111	4.28	32	.134
	1	12.37	111	.111	13.54	127	.107
2	2	11.26	84	.134	7.24	62	.117
	3	13.86	97	.143	3.38	27	.125
	1	13.77	94	.147	39.14	337	.116
3	2	15.09	121	.125	17.24	148	.117
	3	16.67	127	.131	6.82	57	.120
	1	10.60	78	.136	8.51	65	.131
4	2	14.83	104	.143	11.67	101	.116
	3	17.33	142	.122	23.55	191	.123
	1	14.29	95	.150	2.68	23	.116
5	2	13.38	137	.098	16.68	130	.128
	3	17.02	137	.124	9.74	88	.111
Average		14.58	112	.131	12.38	105	.120

Table 19. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 91 cm Rows

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
				Beans/Pod					Beans/Pod		
	1	....	Missing	....			5	38	18	0	135
1	2	11	27	13	0	104	6	62	16	0	178
	3	12	26	16	0	112	10	58	8	0	150
	1	10	11	19	0	89	5	18	5	0	56
2	2	5	32	12	0	105	4	49	5	0	117
	3	2	21	15	0	89	9	57	8	0	147
	1	6	20	13	0	85	2	9	2	0	26
3	2	5	19	13	0	82	6	46	11	0	131
	3	5	22	16	0	97	5	24	7	0	74
	1	6	30	13	0	105	12	51	7	0	135
4	2	11	33	12	0	113	11	44	11	0	132
	3	9	28	31	0	158	9	62	14	0	175
	1	4	26	2	0	62	6	22	6	0	68
5	2	2	22	8	0	70	11	35	2	0	87
	3	6	21	14	1	94	9	43	8	0	119
Average		8	24	14	0	98	7	41	9	0	115

Table 20. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 91 cm Rows

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	....	Missing		17.89	135	.133
1	2	16.33	104	.157	24.08	178	.135
	3	16.63	112	.149	17.87	150	.119
	1	14.12	89	.159	5.49	56	.098
2	2	12.53	105	.115	14.71	117	.126
	3	13.68	89	.154	18.57	147	.126
	1	10.81	85	.127	3.23	26	.125
3	2	12.56	82	.153	16.05	131	.123
	3	11.80	97	.122	8.68	74	.117
	1	15.09	105	.144	16.76	135	.124
4	2	18.44	113	.163	17.62	132	.134
	3	16.27	158	.103	23.24	175	.133
	1	12.59	62	.203	8.20	68	.121
5	2	9.99	70	.143	12.06	87	.139
	3	12.42	94	.132	14.14	119	.119
Average		13.98	98	.145	14.57	115	.125

Table 21. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 46 cm Rows

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	9	41	26	0	169	5	35	16	0	123
1	2	7	46	27	0	180	6	20	5	0	61
	3	17	52	16	0	169	7	35	19	0	134
	1	6	35	33	0	175	2	30	5	0	77
2	2	7	15	9	0	64	2	14	10	0	60
	3	10	39	18	0	142	6	32	9	0	97
	1	4	57	18	0	172	7	28	6	0	81
3	2	12	31	16	0	122	5	8	3	0	30
	3	2	40	27	0	163	4	36	9	0	103
	1	10	45	27	0	181	3	26	5	0	70
4	2	10	45	22	0	166	6	46	10	0	128
	3	4	13	7	0	51	5	29	7	0	84
	1	6	18	16	0	90	7	25	6	0	75
5	2	10	26	20	0	122	2	38	13	0	117
	3	6	24	21	0	117	11	39	14	0	131
Average		8	35	20	0	139	5	29	9	0	91

Table 22. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 46 cm Rows

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	21.73	169	.129	13.12	123	.107
1	2	23.18	180	.129	7.07	61	.116
	3	22.35	169	.132	17.23	134	.129
	1	19.56	175	.112	9.26	77	.120
2	2	7.26	64	.119	7.07	60	.118
	3	19.25	142	.136	10.29	97	.106
	1	21.31	172	.124	9.84	81	.121
3	2	18.00	122	.148	3.10	30	.103
	3	20.59	163	.126	13.51	103	.131
	1	21.97	181	.121	7.83	70	.112
4	2	21.30	166	.128	14.52	128	.113
	3	6.05	51	.119	9.16	84	.109
	1	11.80	90	.133	9.81	75	.131
5	2	15.19	122	.125	11.78	117	.101
	3	14.83	117	.127	15.52	131	.119
Average		17.64	139	.127	10.61	91	.116

Table 23. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 61 cm Rows

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
			Beans/Pod					Beans/Pod			
	1	6	32	24	0	142	8	20	9	0	75
1	2	8	51	29	0	197	3	9	5	0	36
	3	5	20	21	0	108	9	52	23	0	182
	1	7	23	23	0	122	0	12	4	0	36
2	2	5	43	34	0	193	0	8	5	0	31
	3	6	31	19	0	125	3	10	8	0	47
	1	7	35	24	0	149	4	23	5	0	65
3	2	7	27	7	0	82	6	31	18	0	122
	3	12	49	34	0	212	5	42	21	0	152
	1	5	12	10	0	59	3	29	11	0	94
4	2	14	58	30	0	220	4	39	23	0	181
	3	6	24	0	0	54	7	42	24	0	163
	1	8	55	29	0	205	3	14	3	0	40
5	2	10	44	34	0	200	11	51	27	0	194
	3	2	22	10	0	76	4	10	6	0	42
Average		7	35	22	0	143	5	28	13	0	91

Table 24. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 61 cm Rows

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	17.00	142	.120	8.17	75	.109
1	2	25.74	197	.131	3.46	36	.096
	3	14.05	108	.130	21.33	182	.117
	1	15.60	122	.128	3.40	36	.094
2	2	26.45	193	.137	3.34	31	.108
	3	16.73	125	.140	5.94	47	.126
	1	19.12	149	.128	8.96	65	.138
3	2	11.87	82	.145	12.25	122	.100
	3	34.43	212	.162	19.23	152	.127
	1	7.33	59	.124	10.96	94	.117
4	2	32.93	220	.150	19.77	181	.109
	3	6.18	54	.115	17.89	163	.109
	1	27.28	205	.133	5.67	40	.142
5	2	26.62	200	.133	23.80	194	.123
	3	11.81	76	.155	5.12	42	.122
Average		19.55	143	.135	11.29	91	.116

Table 25. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 76 cm Rows

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
			Beans/Pod					Beans/Pod			
	1	4	32	24	0	140	7	21	17	0	100
1	2	3	16	17	0	86	11	17	24	0	117
	3	7	55	33	0	216	6	49	28	0	188
	1	5	22	24	0	121	4	21	10	0	76
2	2	3	40	21	0	146	6	30	12	0	102
	3	11	39	35	0	194	2	17	10	0	66
	1	4	21	16	0	94	13	39	35	0	196
3	2	19	48	22	0	181	4	10	8	0	48
	3	12	38	26	0	166	11	61	22	0	199
	1	10	45	2	0	106	9	45	7	0	120
4	2	13	48	32	0	205	7	81	21	0	232
	3	6	26	19	0	115	11	33	8	0	101
	1	9	41	33	0	190	5	45	12	0	131
5	2	8	48	29	0	191	2	26	13	0	93
	3	....	Missing		....			....	Missing	....	
Average		8	38	24	0	154	7	36	16	0	125

Table 26. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 76 cm Rows

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	18.10	140	.129	11.83	100	.118
1	2	10.46	86	.122	17.34	117	.148
	3	27.00	216	.125	21.56	188	.115
	1	16.07	121	.133	7.52	76	.099
2	2	17.42	146	.119	10.76	102	.106
	3	23.96	194	.124	8.00	66	.121
	1	11.07	94	.118	24.69	196	.126
3	2	23.94	181	.151	5.20	48	.108
	3	22.99	166	.139	26.78	199	.135
	1	13.82	106	.130	13.84	120	.115
4	2	23.44	205	.114	23.61	232	.102
	3	15.34	115	.113	11.36	101	.112
	1	24.60	190	.129	13.22	131	.101
5	2	25.11	191	.132	10.13	93	.109
	3	....	Missing		....	Missing	
Average		19.87	154	.127	14.50	125	.115

Table 27. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 91 cm Rows

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
			Beans/Pod					Beans/Pod			
	1	12	40	24	0	164	12	29	23	0	139
1	2	12	42	33	0	195	13	60	23	0	217
	3		....	Missing	....			....	Missing	....	
	1	14	44	49	0	205	6	17	10	0	70
2	2	2	50	28	0	186	11	38	11	0	120
	3	10	37	27	0	165	4	36	18	0	130
	1	5	48	19	0	158	10	21	6	0	70
3	2	6	24	30	0	144	2	27	10	0	86
	3	5	35	38	0	180	3	9	10	0	51
	1	11	33	35	0	180	7	36	19	0	136
4	2	3	23	19	0	106	9	45	18	0	153
	3	12	53	26	0	196	8	18	10	0	74
	1	3	46	21	0	158	12	35	33	0	181
5	2	7	43	33	0	192	7	39	28	0	169
	3	3	27	27	0	138	1	22	8	0	69
Average		8	39	29	0	171	8	31	17	0	119

Table 28. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 91 cm Rows

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	21.66	164	.132	15.59	139	.112
1	2	24.58	195	.126	22.67	217	.105
	3	....	Missing		....	Missing	
	1	32.75	205	.160	9.25	70	.132
2	2	23.43	186	.126	12.77	120	.106
	3	22.40	165	.136	16.64	130	.128
	1	18.78	158	.119	9.40	70	.134
3	2	20.94	144	.145	9.30	86	.108
	3	24.62	189	.130	5.70	51	.112
	1	25.99	182	.143	17.83	136	.131
4	2	13.19	106	.124	16.75	153	.110
	3	28.79	196	.147	7.83	74	.106
	1	22.48	158	.142	20.18	181	.112
5	2	23.44	192	.122	21.13	169	.125
	3	17.94	138	.130	7.66	69	.111
Average		22.94	171	.134	13.76	119	.116

Table 29. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 46 cm Rows

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	8	21	5	0	65	6	17	3	0	49
1	2	8	23	6	0	72	6	19	7	0	65
	3	11	25	6	0	79	0	7	1	0	17
	1	10	19	2	0	54	6	30	1	0	69
2	2	8	28	10	0	94	15	40	14	0	137
	3	11	23	8	0	81	7	27	3	0	70
	1	8	11	4	0	42	7	40	4	0	99
3	2	2	0	0	0	2	11	37	5	0	100
	3	21	42	3	0	114	6	38	9	0	109
	1	13	57	4	0	139	6	8	2	0	28
4	2	8	39	9	0	113	3	14	4	0	43
	3	11	51	9	0	140	4	17	4	0	50
	1	13	38	5	0	104	9	25	9	0	86
5	2	9	17	12	0	79	5	24	7	0	74
	3	4	24	7	0	73	4	9	6	0	40
Average		10	28	6	0	83	6	23	5	0	69

Table 30. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 46 cm Rows

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	13.28	65	.204	8.13	49	.166
1	2	12.51	72	.174	11.73	65	.181
	3	17.96	79	.227	2.38	17	.140
	1	10.88	54	.202	9.08	69	.132
2	2	17.28	94	.184	22.85	137	.167
	3	10.49	81	.129	13.11	70	.187
	1	7.87	42	.188	19.90	99	.201
3	2	.28	2	.138	17.61	100	.176
	3	24.63	114	.216	16.72	109	.153
	1	26.72	139	.192	5.11	28	.183
4	2	23.14	113	.205	7.24	43	.168
	3	24.20	140	.173	7.40	50	.148
	1	18.60	104	.179	14.52	86	.169
5	2	13.28	79	.168	11.63	74	.157
	3	12.66	73	.174	6.08	40	.152
Average		15.58	83	.184	11.57	69	.168

Table 31. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 61 cm Rows

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	10	23	2	0	62	2	24	1	0	53
1	2	10	31	7	0	93	3	20	3	0	52
	3	7	25	7	0	78	6	13	2	0	38
	1	8	23	10	0	84	1	18	3	0	46
2	2	9	25	6	0	77	10	22	8	0	78
	3	1	25	2	0	57	13	36	10	0	115
	1	14	40	4	0	106	13	47	13	0	146
3	2	7	19	3	0	54	7	20	11	0	80
	3	6	24	6	0	72	3	18	4	0	51
	1	6	28	4	0	74	6	22	5	0	65
4	2	1	4	1	0	12	8	20	1	0	51
	3	5	26	5	0	72	9	26	8	0	85
	1	5	20	8	0	69	3	29	6	0	79
5	2	15	26	6	0	85	2	18	7	0	59
	3	8	16	7	0	61	2	17	5	0	51
Average		7	24	5	0	71	6	24	6	0	70

Table 32. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 61 cm Rows

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	11.42	62	.184	8.02	53	.151
1	2	15.37	93	.165	8.60	52	.165
	3	10.62	78	.144	5.28	38	.139
	1	14.91	84	.178	7.49	46	.163
2	2	13.65	77	.177	13.71	78	.176
	3	12.33	57	.216	20.67	115	.179
	1	18.47	106	.174	25.71	146	.176
3	2	7.53	54	.140	13.12	80	.164
	3	12.45	72	.173	7.39	51	.145
	1	14.22	74	.192	13.91	65	.214
4	2	2.73	12	.228	9.32	51	.183
	3	11.84	72	.165	12.44	85	.146
	1	13.24	69	.192	13.39	79	.169
5	2	16.78	85	.197	10.00	59	.169
	3	11.60	61	.190	7.54	51	.148
Average		12.48	71	.181	11.77	70	.166

Table 33. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 76 cm Rows

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	9	35	7	0	100	5	29	7	0	84
1	2	12	25	8	0	86	9	26	3	0	70
	3	8	31	8	0	94	5	32	10	0	99
	1	3	29	5	0	76	6	24	10	0	84
2	2	3	20	8	0	67	11	11	13	0	72
	3	12	20	3	0	61	10	25	10	0	90
	1	7	25	15	0	102	5	22	2	0	55
3	2	10	24	6	0	76	16	68	15	0	197
	3	14	40	11	0	127	5	33	5	0	86
	1	15	28	7	0	92	8	27	4	0	74
4	2	4	17	4	0	50	10	54	27	0	199
	3	10	45	17	0	151	4	20	4	0	56
	1	4	24	1	0	55	15	53	12	0	157
5	2	8	23	11	0	87	6	46	2	0	104
	3	16	29	10	0	104	11	48	9	0	134
Average		9	28	8	0	89	9	35	9	0	105

Table 34. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 76 cm Rows

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
1	1	17.62	100	.176	13.78	84	.164
	2	16.24	86	.189	11.47	70	.164
	3	16.97	94	.181	15.43	99	.156
2	1	13.85	76	.182	13.99	84	.167
	2	11.20	67	.167	10.82	72	.150
	3	11.96	61	.196	15.12	90	.168
3	1	18.29	102	.179	9.19	55	.167
	2	13.13	76	.173	33.25	197	.169
	3	22.38	127	.176	13.55	86	.158
4	1	18.71	92	.203	13.53	74	.183
	2	9.41	50	.188	33.48	199	.195
	3	28.43	151	.188	10.59	56	.189
5	1	10.82	55	.197	30.54	157	.195
	2	15.17	87	.174	19.56	104	.188
	3	18.60	104	.179	19.33	134	.144
Average		16.19	89	.183	17.58	105	.168

Table 35. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 91 cm Rows

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
			Beans/Pod					Beans/Pod			
	1	5	27	6	0	77	7	39	12	0	121
1	2	13	37	9	0	114	7	25	11	0	90
	3	24	33	8	0	114	11	49	7	0	130
	1	9	36	6	0	99	9	31	6	0	89
2	2	9	17	8	0	67	8	15	7	0	59
	3	19	33	7	0	106	4	23	6	0	68
	1	5	25	7	0	76	7	17	7	0	62
3	2	13	13	12	0	75	5	16	5	0	52
	3	9	22	13	0	92	0	26	5	0	67
	1	9	30	10	0	99	7	37	6	0	99
4	2	11	42	9	0	122	11	45	13	0	140
	3	11	42	2	0	101	18	74	15	0	211
	1	10	16	8	0	66	9	26	9	0	88
5	2	6	21	3	0	57	5	38	4	0	93
	3	7	17	11	0	74	1	19	2	0	45
Average		11	27	8	0	89	7	32	8	0	96

Table 36. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 91 cm Rows

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
1	1	12.10	77	.157	18.35	121	.152
	2	20.78	114	.182	14.10	90	.157
	3	21.29	114	.187	24.35	130	.187
2	1	17.56	99	.177	11.80	89	.133
	2	11.43	67	.171	9.25	59	.156
	3	18.72	106	.177	10.59	68	.156
3	1	13.19	76	.174	9.16	62	.148
	2	13.12	75	.175	7.69	52	.148
	3	16.53	92	.179	11.77	67	.176
4	1	17.01	99	.172	15.50	99	.157
	2	20.25	122	.165	22.31	140	.159
	3	18.02	101	.179	34.18	211	.162
5	1	11.16	66	.169	14.32	88	.163
	2	12.91	57	.226	18.27	93	.197
	3	12.58	74	.170	6.94	45	.154
Average		15.76	89	.178	15.24	96	.160

Table 37. Pod and Bean Distribution on the Different Fruiting Branches of Mitchell Soybeans Grown in 46 cm Rows

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	4	26	36	5	184	.... Missing				
1	2	2	18	23	3	119	3	13	2	0	35
	3	2	19	42	7	194	0	1	3	0	11
	1	6	28	26	1	144	4	20	12	1	84
2	2	4	24	37	2	171	3	13	4	0	41
	3	2	26	32	1	154	0	5	0	0	10
	1	5	26	30	3	159	3	11	6	0	43
3	2	1	26	43	4	202	5	16	8	0	61
	3	2	18	26	2	124	9	17	35	0	148
	1	4	16	30	1	130	1	1	1	0	6
4	2	8	17	31	2	143	0	5	0	0	10
	3	1	16	31	3	138	3	7	6	0	35
	1	2	21	31	3	149	1	3	2	0	13
5	2	4	15	28	2	140	2	9	4	0	32
	3	4	21	20	3	118	0	3	2	0	12
Average		3	21	31	3	151	2	8	6	0	38

Table 38. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Mitchell Soybeans Grown in 46 cm Rows

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
1	1	32.89	184	.179	....	Missing	....
	2	21.80	119	.183	5.81	35	.166
	3	31.38	194	.162	1.62	11	.147
2	1	18.97	144	.132	10.13	84	.121
	2	23.80	171	.139	5.41	41	.132
	3	23.10	154	.150	1.04	10	.104
3	1	29.63	159	.186	6.98	43	.162
	2	31.65	202	.157	8.13	61	.133
	3	17.81	124	.144	18.48	148	.125
4	1	15.77	130	.121	.64	6	.106
	2	21.61	143	.151	1.10	10	.110
	3	20.74	138	.150	3.81	35	.109
5	1	23.43	149	.157	1.78	13	.137
	2	20.16	140	.144	4.10	32	.128
	3	17.51	118	.148	1.21	12	.101
Average		23.35	151	.154	4.93	38	.129

Table 39. Pod and Bean Distribution on the Different Fruiting Branches of Mitchell Soybeans Grown in 61 cm Rows

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	1	9	32	3	127	0	8	5	0	31
1	2	1	15	37	1	146	0	6	4	0	24
	3	4	33	37	3	193	8	17	9	0	69
	1	1	16	36	4	157	4	29	46	1	201
2	2	7	31	34	0	171	0	15	11	0	63
	3	3	23	32	4	167	4	7	3	0	27
	1	7	22	32	5	167	1	9	4	0	31
3	2	6	24	31	1	151	0	11	5	0	37
	3	6	24	43	4	199	0	2	8	3	27
	1	3	18	44	3	183	2	5	9	0	39
4	2	8	21	27	2	139	2	18	8	0	62
	3	4	29	32	3	170	13	24	16	0	109
	1	11	19	16	1	101	9	14	11	0	70
5	2	16	23	21	0	125	4	6	0	0	16
	3	6	18	16	0	90	2	3	4	0	20
Average		6	23	31	2	152	3	12	9	0	55

Table 40. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Mitchell Soybeans Grown in 61 cm Rows

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	21.08	127	.166	3.75	31	.121
1	2	26.52	146	.182	3.41	24	.142
	3	27.67	193	.143	10.57	69	.153
	1	22.48	157	.143	27.13	201	.135
2	2	26.72	171	.156	9.07	63	.144
	3	25.12	167	.150	3.54	27	.131
	1	26.58	167	.159	4.12	31	.132
3	2	26.72	151	.177	4.88	37	.132
	3	31.98	199	.161	3.84	27	.142
	1	24.01	183	.131	5.17	39	.133
4	2	22.81	139	.164	9.41	62	.152
	3	26.06	170	.153	15.01	109	.138
	1	16.67	101	.165	9.70	70	.139
5	2	21.23	125	.169	2.44	16	.153
	3	15.01	90	.168	2.45	20	.122
Average		24.05	152	.159	7.63	55	.138

Table 41. Pod and Bean Distribution on the Different Fruiting Branches of Mitchell Soybeans Grown in 76 cm Rows

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/
		Beans/Pod					Beans/Pod				
	1	0	22	38	3	170	4	13	9	0	57
1	2	6	18	47	3	195	3	15	4	0	45
	3	2	24	37	4	177	0	12	4	0	36
	1	4	13	36	2	146	10	53	31	0	209
2	2	4	31	42	3	204	10	48	39	0	235
	3	6	28	46	7	228	4	18	7	0	61
	1	10	25	41	5	203	5	18	19	0	98
3	2	3	20	37	1	158	5	19	18	1	101
	3	3	18	30	1	133	4	11	11	0	59
	1	0	22	34	4	162	....	Missing	....		
4	2	12	12	29	1	127	8	27	22	0	128
	3	8	21	24	2	128	7	22	23	1	124
	1	6	13	19	1	93	4	17	24	0	110
5	2	5	28	40	3	196	3	9	3	0	30
	3	4	27	26	0	136	5	20	24	1	121
Average		5	21	35	3	164	5	22	18	0	103

Table 42. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Mitchell Soybeans Grown in 76 cm Rows

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	27.68	170	.163	7.08	57	.124
1	2	30.49	195	.156	5.48	45	.122
	3	28.66	177	.162	6.07	36	.169
	1	21.46	146	.147	29.25	209	.139
2	2	28.63	204	.140	28.46	235	.121
	3	32.64	228	.143	7.38	61	.121
	1	30.41	203	.149	14.15	98	.144
3	2	25.66	158	.162	12.73	101	.126
	3	22.50	133	.169	8.34	59	.141
	1	21.59	162	.133	6.93	0	
4	2	19.70	127	.155	15.72	128	.123
	3	23.04	128	.180	18.47	124	.149
	1	13.67	93	.147	11.16	110	.102
5	2	31.20	196	.159	3.27	30	.109
	3	20.23	136	.149	16.96	121	.140
Average		25.17	164	.154	12.76	103	.121

Table 43. Pod and Bean Distribution on the Different Fruiting Branches of Mitchell Soybeans Grown in 91 cm Rows

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	44	Beans/ Plant
			Beans/Pod					Beans/Pod			
	1	3	24	32	3	159	7	17	2	1	51
1	2	6	22	27	4	147	6	27	16	1	112
	3	3	19	32	1	141	5	23	21	1	118
	1	7	9	29	1	116	....	Missing	....		
2	2	6	21	32	4	156	6	26	32	2	162
	3	....	Missing	....			6	5	6	0	34
	1	4	23	39	7	195	6	31	35	1	177
3	2	1	23	38	3	173	5	28	12	1	101
	3	5	11	31	5	140	19	46	60	1	295
	1	7	21	43	3	190	4	14	7	2	61
4	2	12	17	28	3	142	13	31	38	3	201
	3	6	20	34	0	148	7	19	26	0	123
	1	8	30	39	4	201	9	24	19	0	114
5	2	6	16	35	6	167	11	24	30	0	149
	3	0	33	31	6	188	17	39	40	2	223
Average		5	20	33	4	160	8	25	25	1	137

Table 44. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Mitchell Soybeans Grown in 91 cm Rows

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	21.15	159	.133	6.09	51	.107
1	2	21.59	147	.147	13.55	112	.121
	3	19.59	141	.139	14.43	118	.122
	1	17.39	116	.140	....	Missing	
2	2	23.17	156	.149	21.09	162	.130
	3	....	Missing		4.06	34	.119
	1	26.13	195	.134	24.90	177	.141
3	2	23.91	173	.138	9.22	101	.092
	3	16.41	140	.117	40.87	295	.139
	1	28.31	190	.149	6.61	61	.108
4	2	20.81	142	.147	26.48	201	.132
	3	20.07	148	.136	17.73	123	.144
	1	30.42	201	.151	16.28	114	.143
5	2	25.68	167	.154	22.82	149	.153
	3	29.16	188	.155	29.55	223	.133
Average		23.13	160	.143	18.12	137	.127

Table 45. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 46 cm Rows with Two Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	4	35	6	0	92	9	36	7	0	102
1	2	3	23	9	0	76	4	20	3	0	53
	1	5	41	16	0	135	5	23	4	0	63
2	2	1	10	7	0	32	2	11	5	0	39
	1	2	30	7	0	83	5	19	7	0	64
3	2	4	29	7	0	83	2	21	5	0	59
	1	1	24	6	0	67	3	24	1	0	54
4	2	6	20	6	1	68	2	26	6	0	72
	1	2	18	13	0	77	0	5	0	0	10
5	2	6	44	18	0	148	2	21	1	0	48
Average		3	27	10	0	86	4	21	4	0	57

Table 46. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 46 cm Rows with Two Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	13.57	92	.148	12.73	102	.125
1	2	9.30	76	.122	5.88	53	.111
	1	16.55	135	.123	6.46	63	.103
2	2	3.23	32	.101	3.54	39	.091
	1	14.04	83	.169	7.08	64	.111
3	2	11.61	83	.140	6.03	59	.102
	1	9.58	67	.143	6.44	54	.119
4	2	9.63	68	.142	8.21	72	.114
	1	10.22	77	.133	1.08	10	.108
5	2	17.30	148	.117	5.38	48	.112
Average		11.50	86	.134	6.28	57	.110

Table 47. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 46 cm Rows with Three Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	5	25	6	0	73	0	2	3	0	13
1	2	2	21	2	0	50	6	32	3	0	79
	3	8	23	7	2	83	.... Missing				
	1	6	19	8	0	68	12	51	19	0	171
2	2	3	28	7	0	80	1	10	8	0	45
	3	7	27	15	0	91	2	3	3	0	17
	1	7	18	13	0	82	1	15	2	0	37
3	2	5	16	5	0	52	2	9	4	0	32
	3	4	18	4	0	52	0	4	0	0	8
	1										
4	2	.... Missing					.... Missing				
	3										
	1	3	24	16	0	99	2	9	1	0	23
5	2	11	37	14	0	127	2	11	3	0	33
	3	5	22	9	0	76	3	16	1	0	38
Average		5	23	9	0	78	3	14	4	0	45

Table 48. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 46 cm Rows with Three Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	10.67	73	.146	1.29	13	.099
1	2	5.52	50	.110	8.43	79	.107
	3	10.74	83	.129	....	Missing	
	1	8.48	68	.125	22.00	171	.129
2	2	11.03	80	.138	4.39	45	.098
	3	14.74	91	.162	2.31	17	.136
	1	9.54	82	.116	4.88	37	.132
3	2	7.51	52	.145	3.59	32	.112
	3	6.44	52	.124	1.16	8	.145
	1						
4	2	....	Missing		....	Missing	
	3						
	1	13.63	99	.138	2.78	23	.121
5	2	21.19	127	.167	4.60	33	.139
	3	10.05	76	.132	3.83	38	.101
Average		10.79	78	.136	5.39	45	.119

Table 49. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 46 cm Rows with Four Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	3	30	1	0	66	3	32	2	0	73
1	2	3	5	2	0	19	1	7	1	0	18
	3	8	44	9	0	123		....	Missing	....	
	4	4	22	7	0	69		....	Missing	....	
	1	2	20	8	0	66	5	17	6	0	57
2	2	4	18	7	0	61	3	10	3	0	32
	3	1	10	5	0	36		....	Missing	....	
	4	8	30	5	0	83		....	Missing	....	
	1	3	18	13	0	78	3	25	8	0	77
3	2	8	23	8	0	78		....	Missing	....	
	3	1	21	3	0	52		....	Missing	....	
	4	1	0	0	0	1		....	Missing	....	
	1	0	10	1	0	23		....	Missing	....	
4	2	2	15	1	0	35	2	7	2	0	22
	3	5	13	6	0	49		....	Missing	....	
	4	5	27	5	0	74		....	Missing	....	
	1	5	29	6	0	81	3	11	1	0	28
5	2	3	28	5	0	74	1	15	4	0	43
	3	0	4	3	0	17	0	7	0	0	14
	4	9	30	14	0	111	1	11	3	0	32
Average		4	20	6	0	60	2	14	3	0	40

Table 50. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 46 cm Rows with Four Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	6.85	66	.104	10.17	73	.139
1	2	2.42	19	.128	2.50	18	.139
	3	14.85	123	.121	....	Missing	....
	4	7.97	69	.116	....	Missing	....
	1	9.05	66	.137	7.36	57	.129
2	2	9.91	61	.163	3.61	32	.113
	3	3.29	36	.091	....	Missing	....
	4	10.29	83	.124	....	Missing	....
	1	11.56	78	.148	10.98	77	.143
3	2	12.80	78	.164	....	Missing	....
	3	6.56	52	.126	....	Missing	....
	4	.11	1	.108	....	Missing	....
	1	3.01	23	.131	....	Missing	....
4	2	5.47	35	.156	3.01	22	.137
	3	7.77	49	.159	....	Missing	....
	4	11.87	74	.160	....	Missing	....
	1	13.49	81	.167	3.65	28	.130
5	2	9.94	74	.134	5.50	43	.128
	3	1.84	17	.108	1.86	14	.133
	4	16.26	111	.147	3.33	32	.104
Average		8.27	60	.135	5.20	40	.130

Table 51. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 91 cm Rows with Two Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	6	33	13	0	111	8	42	13	0	131
1	2	5	33	11	0	101	11	64	7	0	160
	1	2	35	19	0	129	11	56	14	0	165
2	2	7	27	10	0	91	8	60	20	0	188
	1	10	26	13	0	101	9	50	14	0	151
3	2	5	22	9	0	76	6	75	17	0	207
	1	6	22	11	0	83	5	56	20	0	177
4	2	1	16	15	0	78	4	39	18	0	136
	1	3	33	11	0	102	11	93	25	0	272
5	2	4	18	14	0	82	9	50	22	0	175
Average		5	27	13	0	96	9	55	17	0	176

Table 52. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 91 cm Rows with Two Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
1	1	15.80	111	.142	16.97	131	.130
	2	14.29	101	.137	20.11	160	.126
2	1	17.51	129	.136	21.41	165	.130
	2	12.29	91	.135	23.91	188	.127
3	1	16.39	101	.162	19.46	151	.129
	2	11.28	76	.148	25.07	207	.121
4	1	11.87	83	.143	20.78	177	.117
	2	11.08	78	.142	16.79	136	.123
5	1	13.37	102	.131	29.92	272	.110
	2	10.97	82	.134	21.63	175	.124
Average		13.48	96	.141	21.60	176	.124

Table 53. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 91 cm Rows with Three Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	4	25	10	0	84	9	81	26	0	249
1	2	3	25	19	0	110	3	34	4	0	83
	3	1	32	10	0	95	6	44	21	0	157
	1	3	30	18	0	117	6	35	11	0	109
2	2	6	20	12	0	82	5	25	13	0	94
	3	3	28	10	0	89	4	57	18	0	172
	1	9	19	11	0	80	2	14	1	0	33
3	2	1	22	14	0	87	4	15	4	0	46
	3	0	22	11	0	77	1	9	2	0	25
	1	6	25	19	0	94	4	43	7	0	111
4	2	1	29	10	0	89	0	3	0	0	6
	3	2	38	10	0	108	4	6	0	0	16
	1	2	29	13	0	99	3	50	4	0	115
5	2	2	32	12	0	102	4	25	6	0	72
	3	1	15	16	0	79	1	7	2	0	21
Average		3	26	13	0	93	4	30	8	0	87

Table 54. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 91 cm Rows with Three Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	11.87	84	.141	31.58	249	.127
1	2	13.82	110	.126	10.38	83	.125
	3	13.88	95	.146	18.33	157	.117
	1	17.32	117	.148	13.71	109	.126
2	2	12.67	82	.155	11.12	94	.118
	3	12.15	89	.137	21.88	172	.127
	1	10.74	80	.134	3.77	33	.114
3	2	10.80	87	.124	5.63	46	.122
	3	9.62	77	.125	2.90	25	.116
	1	14.40	94	.153	14.40	111	.130
4	2	10.41	89	.117	.72	6	.120
	3	16.11	108	.149	1.49	16	.094
	1	11.59	99	.117	10.61	115	.092
5	2	10.74	102	.105	7.91	72	.110
	3	13.41	79	.170	2.18	21	.104
Average		12.63	93	.137	10.44	87	.116

Table 55. Pod and Bean Distribution on the Different Fruiting Branches of Essex Soybeans Grown in 91 cm Rows with Four Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	2	26	8	1	80	11	50	5	0	126
1	2	0	6	6	0	30	8	50	9	0	135
	3	2	12	13	0	65	2	17	2	0	42
	4	6	33	8	0	96	5	15	1	0	38
	1	4	26	7	0	77	1	18	1	0	40
2	2	1	29	11	0	92	3	16	1	0	38
	3	2	23	11	0	81	7	30	7	0	88
	4	3	29	16	0	109	3	28	7	0	80
	1	0	9	10	0	48	1	28	4	0	69
3	2	9	25	12	0	95	2	13	4	0	40
	3	2	27	10	0	86	1	30	3	0	70
	4	5	21	6	0	65	0	5	1	0	13
	1	1	38	9	0	104	4	10	4	0	48
4	2	1	21	11	0	76	2	42	6	0	104
	3	6	20	13	0	85	0	11	6	0	40
	4	5	26	11	0	90	7	24	7	0	76
	1	3	20	9	0	70	6	15	7	0	57
5	2	8	28	6	0	81	0	18	5	0	51
	3	4	26	5	0	71	5	16	3	0	46
	4	6	23	7	0	73	5	38	5	0	96
Average		5	23	10	0	79	4	22	5	0	65

Table 56. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Essex Soybeans Grown in 91 cm Rows with Four Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
1	1	9.12	80	.113	15.21	126	.121
	2	4.53	30	.151	15.53	135	.115
	3	8.33	65	.128	3.86	42	.092
	4	13.02	96	.136	3.63	38	.096
2	1	10.98	77	.143	4.13	40	.103
	2	10.13	92	.110	4.48	38	.118
	3	9.46	81	.117	9.91	88	.113
	4	14.78	109	.136	10.19	80	.127
3	1	15.46	48	.114	7.88	60	.114
	2	14.61	95	.156	5.65	40	.141
	3	12.74	86	.148	7.76	70	.111
	4	8.31	65	.128	1.40	13	.108
4	1	9.58	104	.092	6.10	48	.127
	2	8.60	76	.113	11.40	104	.110
	3	12.91	85	.152	3.89	40	.097
	4	14.32	90	.159	10.73	76	.141
5	1	11.11	70	.159	7.28	57	.128
	2	10.46	81	.128	4.88	51	.096
	3	7.30	71	.103	5.48	46	.119
	4	9.61	73	.132	8.86	96	.092
Average		10.26	79	.131	7.41	65	.113

Table 57. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 46 cm Rows with Two Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	4	34	24	0	144	2	16	5	0	49
1	2	8	15	19	0	95	2	22	2	0	52
	1	1	21	20	0	103	2	17	10	0	66
2	2	2	22	16	0	94	7	17	4	0	53
	1	9	22	26	0	131	4	19	5	0	57
3	2	2	20	20	0	102	10	40	15	0	135
	1	8	26	13	0	99	1	10	7	0	42
4	2	7	35	24	0	149	3	11	2	0	31
	1	3	40	28	0	167	3	14	15	0	76
5	2	2	27	18	0	110	0	7	4	0	26
Average		5	27	21	0	120	4	17	7	0	59

Table 58. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 46 cm Rows with Two Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	20.39	144	.142	6.41	49	.131
1	2	14.81	95	.156	7.52	52	.145
	1	13.12	103	.127	7.54	66	.114
2	2	12.94	94	.138	7.10	53	.134
	1	17.78	131	.136	6.70	57	.118
3	2	13.32	102	.131	17.44	135	.129
	1	9.31	99	.094	3.60	42	.086
4	2	14.50	149	.097	2.93	31	.094
	1	22.97	167	.138	8.33	76	.110
5	2	13.03	110	.119	2.75	26	.106
Average		15.22	120	.128	7.03	59	.117

Table 59. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 46 cm Rows with Three Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	2	19	20	0	100	1	13	10	0	57
1	2	3	14	25	0	106	2	8	2	0	24
	3	1	22	16	0	93	2	7	1	0	19
	1	5	16	2	0	43	2	6	2	0	20
2	2	2	17	11	0	69	3	11	1	0	28
	3	4	8	12	0	56	3	16	0	0	35
	1	7	16	9	0	66	2	24	5	0	65
3	2	5	24	10	0	83	2	6	0	0	14
	3	4	26	9	0	83	0	9	3	0	27
	1	3	38	18	0	133	4	21	10	0	76
4	2	3	17	18	0	91	3	18	11	0	72
	3	6	8	6	0	40	5	17	10	0	69
	1	1	20	12	0	77	2	14	2	0	36
5	2	2	37	16	0	124	4	6	2	0	22
	3	3	14	6	0	49	2	4	2	0	16
Average		3	20	12	0	81	3	12	4	0	39

Table 60. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 46 cm Rows with Three Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	11.83	100	.118	6.16	57	.108
1	2	14.04	106	.133	2.50	24	.104
	3	11.22	93	.121	2.35	19	.124
	1	5.37	43	.125	2.27	20	.113
2	2	9.39	69	.136	3.59	28	.128
	3	8.20	56	.147	3.88	35	.111
	1	11.72	66	.178	8.51	65	.131
3	2	12.30	83	.148	1.79	14	.128
	3	11.72	83	.141	3.59	27	.133
	1	17.34	133	.130	10.41	76	.137
4	2	14.19	91	.156	8.94	72	.124
	3	4.92	40	.123	7.94	69	.115
	1	9.68	77	.126	3.67	36	.102
5	2	15.08	124	.122	2.44	22	.111
	3	4.79	49	.098	1.35	16	.085
Average		10.79	81	.133	4.63	39	.117

Table 61. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 46 cm Rows with Four Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	5	14	5	0	48	1	5	0	0	11
1	2	3	5	2	0	19	21	38	16	0	145
	3	2	7	4	0	28	3	19	7	0	62
	4	7	29	18	0	119	1	26	3	0	62
	1	5	10	8	0	49	2	24	9	0	77
2	2	2	4	4	0	22	4	12	2	0	34
	3	1	0	2	0	7		....	Missing	....	
	4	1	9	7	0	40	3	39	32	0	177
	1	8	21	33	0	149	5	33	12	0	107
3	2	1	15	3	0	40	5	28	10	0	91
	3	1	12	1	0	28		....	Missing	....	
	4	4	29	18	0	116		....	Missing	....	
	1	2	7	6	0	34	4	20	7	0	65
4	2		....	Missing	....			....	Missing	....	
	3	5	19	9	0	70	1	11	1	0	26
	4	5	15	3	0	44		....	Missing	....	
	1	12	27	13	0	105	1	14	4	0	41
5	2	5	25	13	0	94		....	Missing	....	
	3	6	18	8	0	66	1	8	1	0	20
	4	6	13	6	0	50	3	17	2	0	43
Average		5	16	8	0	59	4	21	8	0	69

Table 62. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 46 cm Rows with Four Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
1	1	5.00	48	.104	1.02	11	.093
	2	1.76	19	.093	14.08	145	.097
	3	3.07	28	.110	5.91	62	.095
	4	12.92	119	.109	5.23	62	.084
2	1	5.69	49	.116	6.66	77	.087
	2	2.64	22	.120	3.18	34	.093
	3	1.00	7	.142	....	Missing	....
	4	4.95	40	.124	24.17	177	.137
3	1	23.31	149	.156	14.67	107	.137
	2	5.34	40	.134	12.33	91	.136
	3	2.38	28	.085	....	Missing	....
	4	17.03	116	.147	....	Missing	....
4	1	4.33	34	.127	7.77	65	.120
	2	....	Missing	....	....	Missing	....
	3	8.35	70	.119	2.95	26	.114
	4	6.36	44	.145	....	Missing	....
5	1	12.45	105	.114	4.43	41	.108
	2	12.43	94	.132	....	Missing	....
	3	7.53	66	.114	2.29	20	.114
	4	5.29	50	.106	4.67	43	.109
Average		7.40	59	.121	7.81	69	.109

Table 63. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 91 cm Rows with Two Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	2	26	31	0	147	13	40	27	0	174
1	2	9	32	35	0	178	6	33	0	0	72
	1	1	10	22	0	87	6	40	16	0	134
2	2	7	33	26	0	151	1	14	9	0	56
	1	5	8	44	0	153	11	74	43	0	288
3	2	4	51	17	0	157	12	79	28	0	254
	1	6	33	31	0	165	11	39	48	0	233
4	2	6	20	20	0	106	4	55	38	0	228
	1	2	18	27	0	119	6	31	31	0	161
5	2	4	28	25	0	135	2	33	19	0	125
Average		5	26	28	0	140	7	44	26	0	173

Table 64. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 91 cm Rows with Two Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
1	1	18.64	147	.127	21.28	174	.122
	2	21.89	178	.123	19.88	72	.176
2	1	10.33	87	.119	16.11	134	.120
	2	20.10	151	.133	6.43	56	.115
3	1	28.08	153	.184	38.70	288	.134
	2	17.40	157	.111	36.11	254	.142
4	1	21.81	165	.132	28.84	233	.124
	2	15.17	106	.143	26.70	228	.117
5	1	16.00	119	.135	19.06	161	.118
	2	18.06	135	.134	13.38	125	.107
Average		18.75	140	.134	22.65	173	.128

Table 65. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 91 cm Rows with Three Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	5	20	19	0	102	3	18	50	0	189
1	2	8	18	30	0	134	2	8	5	0	33
	3	13	14	12	0	77	8	47	20	0	162
	1	3	28	18	0	113	6	20	8	0	70
2	2	2	14	15	0	75	6	17	5	0	55
	3	8	40	23	0	157	1	20	6	0	59
	1	2	32	34	0	168	61	37	5	0	150
3	2	27	19	9	0	92	7	75	34	0	259
	3	0	11	7	0	43	0	6	3	0	21
	1	8	29	22	0	132	1	16	9	0	60
4	2	1	19	24	0	111	4	16	3	0	45
	3	8	14	29	0	123	6	24	4	0	66
	1	4	33	25	0	145	3	10	7	0	44
5	2	11	18	22	0	113	3	5	3	0	22
	3	8	21	32	0	146	....	Missing	....		
Average		7	22	22	0	115	8	23	12	0	88

Table 66. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 91 cm Rows with Three Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
1	1	15.06	102	.148	25.75	189	.136
	2	18.97	134	.142	3.82	33	.116
	3	13.63	77	.177	25.17	162	.155
2	1	14.66	113	.130	8.23	70	.118
	2	9.45	75	.126	6.16	55	.112
	3	21.33	157	.134	6.39	59	.108
3	1	23.51	168	.140	21.68	150	.155
	2	15.20	92	.165	33.05	259	.128
	3	4.83	43	.112	2.03	21	.097
4	1	15.38	132	.117	6.89	60	.115
	2	13.68	111	.123	4.67	45	.104
	3	15.55	123	.127	7.85	66	.119
5	1	20.04	145	.138	5.43	44	.123
	2	15.09	113	.134	2.51	22	.114
	3	20.65	146	.141	....	Missing	
Average		15.78	115	.137	10.91	88	.122

Table 67. Pod and Bean Distribution on the Different Fruiting Branches of Forrest Soybeans Grown in 91 cm Rows with Four Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
			Beans/Pod					Beans/Pod			
	1	5	16	19	0	94	5	46	14	0	139
1	2	6	25	24	0	128	2	16	3	0	43
	3		....	Missing	....		3	28	16	0	107
	4		....	Missing	....			....	Missing	....	
	1	5	24	18	0	107	4	17	21	0	101
2	2	7	14	14	0	77	0	10	6	0	38
	3		....	Missing	....		3	10	6	0	41
	4	2	19	30	0	130	1	12	13	0	64
	1	7	20	23	0	116	0	5	3	0	19
3	2	3	19	15	0	86		....	Missing	....	
	3	6	35	26	0	154	6	16	9	0	65
	4	7	15	16	0	85		....	Missing	....	
	1	3	22	14	0	89	2	17	10	0	66
4	2	2	19	16	0	88	0	28	10	0	86
	3	3	27	28	0	141	0	24	15	0	93
	4		....	Missing	....			....	Missing	....	
	1	0	8	12	0	52		....	Missing	....	
5	2	7	20	12	0	83	0	4	6	0	26
	3	5	20	23	0	114	1	14	6	0	47
	4	3	20	12	0	79	2	16	7	0	55
Average		4	20	19	0	101	2	18	10	0	66

Table 68. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of Forrest Soybeans Grown in 91 cm Rows with Four Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	9.62	94	.102	16.00	139	.115
1	2	15.10	128	.118	4.94	43	.115
	3	....	Missing		10.28	107	.096
	4	....	Missing		....	Missing	
	1	15.08	107	.141	9.27	101	.092
2	2	11.28	77	.147	2.70	38	.071
	3	....	Missing		4.01	41	.098
	4	14.14	130	.109	4.01	64	.098
	1	14.80	116	.128	1.77	19	.093
3	2	9.11	86	.106	....	Missing	
	3	20.59	154	.134	6.77	65	.104
	4	7.53	85	.089	....	Missing	
	1	10.21	89	.115	7.08	66	.107
4	2	10.32	88	.117	9.51	86	.111
	3	18.66	141	.132	9.12	93	.098
	4	....	Missing		....	Missing	
	1	5.38	52	.104	....	Missing	
5	2	11.05	83	.133	2.61	26	.100
	3	13.61	114	.119	4.25	47	.091
	4	9.08	79	.115	5.49	55	.100
Average		12.22	101	.119	6.52	66	.099

Table 69. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 46 cm Rows with Two Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1 Bean/Pod	2 Beans/Pod	3 Beans/Pod	4 Beans/Pod	Beans/ Plant	1 Bean/Pod	2 Beans/Pod	3 Beans/Pod	4 Beans/Pod	Beans/ Plant
1	1		....	Missing	....			....	Missing	....	
	2		....	Missing	....			....	Missing	....	
2	1	3	18	7	0	60	2	17	4	0	48
	2	14	17	7	0	69	4	15	7	0	55
3	1	9	19	6	0	65	1	7	1	0	18
	2	12	25	13	0	101	0	13	4	0	38
4	1	4	19	6	0	60	2	18	5	0	53
	2	7	24	7	0	76	5	15	1	0	38
5	1	10	28	5	0	81	1	11	6	0	41
	2	9	17	10	0	73	5	23	4	0	63
Average		9	21	8	0	73	3	15	4	0	44

Table 70. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 46 cm Rows with Two Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	....	Missing		....	Missing	
1	2	....	Missing		....	Missing	
	1	8.95	60	.149	7.62	48	.159
2	2	13.38	69	.194	9.22	55	.180
	1	10.42	65	.160	2.65	18	.147
3	2	17.40	101	.172	6.26	38	.165
	1	10.34	60	.172	9.11	53	.172
4	2	15.36	76	.202	7.20	38	.189
	1	16.04	81	.198	6.62	41	.162
5	2	13.12	73	.180	10.57	63	.168
Average		13.13	73	.179	7.49	44	.168

Table 71. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 46 cm Rows with Three Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
			Beans/Pod					Beans/Pod			
	1	1	8	6	0	35	4	17	4	0	50
1	2	2	12	3	0	35	1	2	0	0	5
	3		....	Missing		....	1	7	1	0	18
	1	3	12	5	0	42	14	28	4	0	82
2	2	11	19	3	0	58	5	13	5	0	46
	3	5	12	6	0	47	12	16	2	0	50
	1	11	34	21	0	142	10	57	6	0	142
3	2	9	20	15	0	94	1	9	2	0	25
	3		....	Missing		....		....	Missing		....
	1	6	23	7	0	73	3	13	4	0	41
4	2	7	21	10	0	79	6	30	5	0	81
	3	5	14	6	0	51	2	10	3	0	31
	1	14	27	7	0	89	8	14	1	0	39
5	2	14	13	1	0	43	2	8	0	0	18
	3	4	13	3	0	39	1	2	2	0	11
Average		7	18	7	0	63	4	17	3	0	46

Table 72. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 46 cm Rows with Three Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	3.53	35	.101	6.47	50	.129
1	2	3.31	35	.095	.59	5	.117
	3	....	Missing		2.15	18	.119
	1	6.52	42	.155	14.79	82	.180
2	2	11.34	58	.196	7.36	46	.159
	3	7.52	47	.160	8.50	50	.170
	1	18.08	142	.127	26.58	142	.187
3	2	13.86	94	.147	4.28	25	.171
	3	....	Missing		....	Missing	
	1	14.06	73	.193	7.20	41	.176
4	2	14.62	79	.185	10.49	81	.130
	3	7.59	51	.149	5.42	31	.175
	1	15.30	89	.172	6.74	39	.173
5	2	7.90	43	.184	2.75	18	.153
	3	7.11	39	.182	1.68	11	.152
Average		10.01	63	.157	7.50	46	.157

Table 73. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 46 cm Rows with Four Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	15	29	2	0	79	2	3	1	0	14
1	2	6	15	5	0	51	6	41	5	0	103
	3	4	17	4	0	50	6	22	2	0	56
	4	2	21	6	0	62	1	10	2	0	27
	1	3	4	1	0	14	3	6	1	0	18
2	2		....	Missing	....		7	14	3	0	44
	3	3	6	2	0	21	6	6	0	0	18
	4	3	8	0	0	19	5	7	1	0	22
	1	12	20	8	0	76	2	2	0	0	6
3	2	7	14	5	0	50		....	Missing	....	
	3	2	21	6	0	62	2	9	1	0	23
	4	6	10	0	0	26	3	9	0	0	21
	1	12	28	3	0	77	6	32	2	0	76
4	2		....	Missing	....		4	9	1	0	25
	3		....	Missing	....			....	Missing	....	
	4		....	Missing	....			....	Missing	....	
	1	8	20	4	0	60	11	14	1	0	42
5	2	8	20	5	0	63		....	Missing	....	
	3	0	7	0	0	14	4	15	1	0	37
	4	1	11	5	0	38	12	14	0	0	40
Average		6	16	4	0	48	5	13	1	0	36

Table 74. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 46 cm Rows with Four Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	16.13	79	.204	1.93	14	.138
1	2	9.44	51	.185	17.36	103	.169
	3	8.03	50	.161	11.17	56	.199
	4	10.82	62	.175	3.45	27	.128
	1	3.20	14	.228	2.93	18	.163
2	2	....	Missing		7.27	44	.165
	3	3.20	21	.152	3.47	18	.193
	4	3.51	19	.185	3.49	22	.159
	1	16.31	76	.215	1.09	6	.181
3	2	10.42	50	.208	....	Missing	
	3	11.13	62	.180	4.27	23	.186
	4	5.59	26	.215	3.49	21	.166
	1	11.96	77	.155	12.87	76	.169
4	2	....	Missing		4.49	25	.179
	3	....	Missing		....	Missing	
	4	....	Missing		....	Missing	
	1	10.35	60	.173	6.48	42	.154
5	2	12.68	63	.201	....	Missing	
	3	1.45	14	.104	5.37	37	.145
	4	6.04	38	.159	6.65	40	.166
Average		8.77	48	.181	5.99	36	.166

Table 75. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 91 cm Rows with Two Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	3	13	15	0	74	18	66	19	0	207
1	2	2	12	12	0	62	6	33	13	0	111
	1	6	33	17	0	123	8	25	3	0	67
2	2	5	28	6	0	79	7	26	2	0	65
	1	4	21	3	0	55	11	49	16	0	157
3	2	8	18	9	0	71	11	19	2	0	55
	1	7	31	4	0	81	2	13	2	0	34
4	2	6	26	14	0	100	8	41	77	0	111
	1	3	21	11	0	78	14	45	8	0	128
5	2	3	20	10	0	73	7	19	13	0	84
Average		5	23	10	0	80	9	34	9	0	102

Table 76. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 91 cm Rows with Two Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	12.87	74	.174	33.34	207	.161
1	2	11.04	62	.178	17.58	111	.158
	1	17.31	123	.141	10.29	67	.154
2	2	11.53	79	.146	9.89	65	.152
	1	11.20	55	.204	24.35	157	.155
3	2	12.94	71	.182	10.19	55	.185
	1	13.63	81	.168	5.14	34	.151
4	2	14.48	100	.145	14.63	111	.132
	1	12.96	78	.166	20.16	128	.158
5	2	12.88	73	.177	12.16	84	.145
Average		13.08	80	.168	15.77	102.	.155

Table 77. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 91 cm Rows with Three Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
			Beans/Pod					Beans/Pod			
1	1 2 3	.... Missing					.... Missing				
2	1 2 3	.... Missing					.... Missing				
3	1	3	9	2	0	27	2	21	2	0	50
	2	6	20	0	0	46	13	15	2	0	49
	3	4	18	7	0	61	9	20	6	0	67
4	1	6	24	9	0	81	7	25	14	0	99
	2	9	34	9	0	104	5	32	7	0	90
	3	7	26	7	0	80	0	12	5	0	39
5	1	13	24	12	0	97	2	11	0	0	24
	2	5	28	12	0	97	2	11	2	0	30
	3	5	16	3	0	43	4	23	4	0	62
Average		6	22	7	0	71	5	19	5	0	57

Table 78. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 91 cm Rows with Three Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
1	1 2 3	.....	Missing		....	Missing	....
2	1 2 3	.....	Missing		....	Missing	....
3	1	4.51	27	.167	7.20	50	.144
	2	7.40	46	.161	6.76	49	.138
	3	10.23	61	.168	9.72	67	.145
4	1	17.85	81	.220	16.79	99	.170
	2	20.93	104	.201	16.20	90	.180
	3	16.30	80	.204	4.17	39	.107
5	1	18.81	97	.194	3.95	24	.164
	2	17.38	97	.179	5.11	30	.170
	3	9.19	43	.214	10.03	62	.162
Average		13.62	71	.190	8.81	57	.153

Table 79. Pod and Bean Distribution on the Different Fruiting Branches of York Soybeans Grown in 91 cm Rows with Four Plants per Hill

		UPPER BRANCHES					FAN BRANCHES				
		Number of Pods With				Number of	Number of Pods With				Number of
Rep.	Plant No.	1	2	3	4	Beans/ Plant	1	2	3	4	Beans/ Plant
		Beans/Pod					Beans/Pod				
	1	3	17	5	0	52	3	15	2	0	39
1	2	3	14	7	0	52	3	11	2	0	31
	3	12	16	7	0	65	....	Missing	....		
	4	4	20	4	0	56	1	8	1	0	20
	1	9	17	10	0	73	12	29	10	0	100
2	2	9	20	5	0	64	1	12	2	0	31
	3	2	17	1	0	39	2	16	2	0	42
	4	2	15	14	0	74	1	15	2	0	37
	1	15	26	9	0	94	3	20	6	0	61
3	2	3	16	8	0	59	5	26	7	0	78
	3	4	15	9	0	61	1	15	8	0	55
	4	0	5	3	0	19	0	8	3	0	25
	1	10	15	5	0	55	2	24	1	0	53
4	2	2	9	3	0	29	2	10	2	0	28
	3	5	31	6	0	85	....	Missing	....		
	4	10	26	3	0	71	5	11	4	0	39
	1	....	Missing	....			....	Missing	....		
5	2	2	20	5	0	57	4	9	1	0	25
	3	4	9	2	0	28	4	20	2	0	50
	4	5	27	6	0	77	....	Missing	....		
Average		6	18	6	0	58	3	16	3	0	45

Table 80. Total Number of Beans, Total and Average Bean Weight on Different Fruiting Branches of York Soybeans Grown in 91 cm Rows with Four Plants per Hill

		UPPER BRANCHES			FAN BRANCHES		
Rep.	Plant No.	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight	Total Bean Weight/ Plant	Number of Beans/ Plant	Average Bean Weight
		g		g	g		g
	1	9.16	52	.176	7.85	39	.201
1	2	9.27	52	.178	5.58	31	.180
	3	13.12	65	.202	....	Missing	....
	4	10.33	56	.184	3.56	20	.178
	1	13.24	73	.181	15.13	100	.151
2	2	13.40	64	.209	4.23	31	.137
	3	6.86	39	.176	6.50	42	.155
	4	13.03	74	.176	7.20	37	.195
	1	15.75	94	.168	6.06	61	.099
3	2	7.06	56	.126	12.46	78	.160
	3	7.39	61	.121	6.16	55	.112
	4	2.48	19	.130	1.77	25	.071
	1	12.24	55	.223	9.24	53	.174
4	2	5.89	29	.155	5.31	28	.190
	3	14.45	85	.170	....	Missing	....
	4	13.88	71	.196	7.64	39	.196
	1	....	Missing	....	....	Missing	....
5	2	8.21	57	.144	3.97	25	.159
	3	5.29	28	.189	8.61	50	.172
	4	15.48	77	.201	....	Missing	....
Average		10.34	58	.174	6.95	45	.158

APPENDIX B

Table 81. Essex Soybean Yields for 46, 61, 76, and 91 cm Drilled Row Spacings

Row Spacings	Replications					Average
	1	2	3	4	5	
cm	kg/ha					
46	4521	5027	4926	3938	4193	4523
61	4650	3757	3745	4140	4637	4187
76	3622	4025	3353	3447	3689	3622
91	3353	3353	2715	3179	2742	3071

Table 82. Forrest Soybean Yields for 46, 61, 76, and 91 cm Drilled Row Spacings

Row Spacings	Replications				Average
	1	2	3	4	
cm	kg/ha				
46	3972	4980	4617	4039	4402
61	3810	3315	2641	3757	3380
76	2285	3541	2943	2943	2923
91	2271	2554	2688	2997	2628

Table 83. York Soybean Yields for 46, 61, 76, and 91 cm Drilled Row Spacings

Row Spacings	Replications 1	2	3	4	5	Average
cm	kg/ha					
46	3797	4166	5013	4012	3850	4166
61	3716	3400	3118	3340	2950	3306
76	3300	3461	3783	3394	3266	3441
91	3152	3313	3259	3555	3205	3300

Table 84. Mitchell Soybean Yields for 46, 61, 76, and 91 cm Drilled Row Spacings

Row Spacings	Replications 1	2	3	4	5	Average
cm	kg/ha					
46	3320	3917	4045	4220	4099	3898
61	3817	3528	3400	3777	3286	3561
76	3259	3380	3259	3622	3286	3360
91	3017	3145	2943	2890	2816	2964

Table 85. Essex Soybean Yields for Four, Three, and Two Plants per Hill when Grown in 46 and 91 cm Rows

Treatments							
Row Spacing	Plants/ Hill	Replications 1	2	3	4	5	Average
cm		kg/ha					
46	4	5248	5248	4583	5248	4751	5013
46	3	6001	5000	4664	5080	5833	5316
46	2	5168	5168	4415	5584	5087	5087
91	4	4464	4247	3418	4832	4583	4347
91	3	4086	2917	3830	4086	3830	3750
91	2	3414	3253	3333	2917	3253	3232

Table 86. Forrest Soybean Yields for Four, Three, and Two Plants per Hill when Grown in 46 and 91 cm Rows

Treatments							
Row Spacing	Plants/ Hill	Replications 1	2	3	4	5	Average
cm		kg/ha					
46	4	3501	4415	3502	3669	4086	3837
46	3	3669	3998	3414	3583	3830	3696
46	2	4166	3582	3750	3918	3857	3857
91	4	3830	3998	3333	3830	3085	3615
91	3	3253	3669	3414	3582	3998	3582
91	2	2581	4415	2668	4334	3085	3414

Table 87. York Soybean Yields for Four, Three, and Two Plants per Hill when Grown in 46 and 91 cm Rows

Treatments							
Row Spacing	Plants/ Hill	Replications 1	2	3	4	5	Average
cm		kg/ha					
46	4	5080	3689	4509	4758	4261	4462
46	3	5168	4590	5000	4838	4429	4805
46	2	4429	4838	4348	5168	4697	4697
91	4	3528	4758	2950	4261	2460	3589
91	3	4099	3031	4019	3118	3441	3541
91	2	3710	3609	3609	3441	3528	3589

APPENDIX C

Table 88. Chlorophyll Content in Trifoliates of Essex Soybeans at Flower Initiation Time when Grown in Hills 15 cm Apart

Trifoliate Height	Plant Sample Number 1	2	3	4	5	Average
	mg chlorophyll/g					
	One Plant Per Hill					
6*	.88	.64	.84	.92	1.04	.88
5	.92	.92	1.44	1.16	1.32	1.16
4	.80	1.28	1.00	1.04	1.00	1.04
3	1.28	1.04	1.08	1.00	1.28	1.12
2	.88	.92	.72	1.08	1.84	1.08
1	1.24	1.28	.96	.68	1.64	1.16
	Two Plants Per Hill					
6*	.56	.88	1.16	.88	1.12	.92
5	.96	.84	1.28	.88	1.16	1.04
4	.84	.92	1.08	.64	.64	.84
3	1.24	.88	1.28	1.02	1.36	1.16
2	1.18	1.08	1.12	.96	1.56	1.24
1	1.06	1.28	.92	.54	1.20	1.12
	Three Plants Per Hill					
6*	1.16	1.16	.68	.96	1.44	1.08
5	1.20	1.36	.96	1.08	1.16	1.16
4	1.20	1.28	1.16	.88	1.44	1.20
3	1.00	1.32	1.20	1.28	1.48	1.32
2	.88	1.24	1.40	1.04	1.32	1.16
1	.64	.72	1.40	1.12	1.12	1.00

*Upper Trifoliate

Table 89. Chlorophyll Content in Trifoliates of Essex Soybeans at Flower Initiation Time when Grown in Hills 30 cm Apart

Trifoliate Height	Plant Sample Number 1	2	3	4	5	Average
	----------mg chlorophyll/g----------					
			One Plant Per Hill			
6*	.64	.72	.80	.84	.84	.76
5	.92	.88	1.04	1.00	.84	.92
4	.96	.76	.92	.96	.90	.92
3	1.08	.88	.52	.72	1.04	.84
2	.80	.72	.56	.54	.80	.68
1	.48	.52	.84	.56	.80	.64
			Two Plants Per Hill			
6*	.88	.56	1.04	.76	.64	.76
5	1.28	.84	1.20	.88	1.12	1.08
4	1.04	.84	1.24	1.12	.92	1.04
3	.80	.92	1.48	1.24	1.24	1.12
2	.48	1.24	1.12	.92	.80	.92
1	.20	.96	.84	.64	.60	.64
			Three Plants Per Hill			
6*	.56	.64	.52	.68	.84	.64
5	.64	.88	.68	.60	.88	.76
4	.96	1.28	1.00	.64	.88	.92
3	.96	.80	.88	.60	.76	.80
2	.80	.60	.72	.60	.88	.72
1	.52	.44	.72	.44	.72	.56

*Upper Trifoliate

Table 90. Chlorophyll Content in Trifoliates of Forrest Soybeans at Flower Initiation Time when Grown in Hills 15 cm Apart

Trifoliate Height	Plant Sample Number 1	2	3	4	5	Average
	mg chlorophyll/g					
	One Plant Per Hill					
6*						
5						
4						
3	. . . . . Missing					
2						
1						
	Two Plants Per Hill					
6*	.60	.52	.56	.72	Missing	.60
5	.52	.68	.76	.96	Missing	.72
4	.84	.80	.72	.88	Missing	.80
3	.60	.72	.64	.72	Missing	.68
2	.72	.60	.88	.80	Missing	.76
1	.80	.88	.72	.52	Missing	.72
	Three Plants Per Hill					
6*	.56	.52	.40	.40	Missing	.48
5	.56	.52	.72	.52	Missing	.56
4	.68	.64	.92	.80	Missing	.76
3	.52	.64	.68	.68	Missing	.64
2	.92	1.04	.72	.72	Missing	.84
1	.68	.72	.48	.88	Missing	.68

*Upper Trifoliate

Table 91. Chlorophyll Content in Trifoliates of Forrest Soybeans at Flower Initiation Time when Grown in Hills 30 cm Apart

Trifoliate Height	Plant Sample Number 1	2	3	4	5	Average
	mg chlorophyll/g					
			One Plant Per Hill			
6*	.68	.16	.64	.40	.84	.56
5	1.04	.72	1.04	.92	1.00	.96
4	1.32	.72	.84	.84	.90	.92
3	.96	.72	.76	.88	1.04	.88
2	.76	.36	.60	1.20	.60	.68
1	.60	.44	.64	.60	.68	.60
			Two Plants Per Hill			
6*	.56	.60	.68	.84	.96	.72
5	.84	.72	.60	.88	1.08	.84
4	1.12	.72	.80	.72	1.08	.88
3	.60	.72	.88	.60	.96	.76
2	.88	.40	.84	.84	1.08	.80
1	.40	.36	.68	.44	.72	.52
			Three Plants Per Hill			
6*	.48	.48	.32	.28	Missing	.40
5	.36	.68	.32	.60	Missing	.48
4	.32	.40	.64	.60	Missing	.48
3	.64	.80	.72	.60	Missing	.68
2	.64	.60	.52	.92	Missing	.68
1	.40	.32	.32	.32	Missing	.32

*Upper Trifoliate

Table 92. Chlorophyll Content in Trifoliates of York Soybeans at Flower Initiation Time when Grown in Hills 15 cm Apart

Trifoliate Height	Plant Sample Number 1	2	3	4	5	Average
	mg chlorophyll/g					
			One Plant Per Hill			
7*	.68	.60	.64	.64	.56	.64
6	.44	1.00	.84	1.08	.72	.84
5	1.00	.80	1.32	1.20	.92	1.04
4	.96	1.00	1.12	1.16	.88	1.04
3	.96	.84	1.36	1.12	.72	1.00
2	.72	1.12	1.44	1.08	.48	.96
1	.60	.88	1.20	.92	.08	.72
			Two Plants Per Hill			
7*	.40	.36	.36	.36	.32	.36
6	.64	.40	.64	.36	.32	.48
5	.68	.44	.56	.44	.60	.56
4	.68	.44	.44	.60	.56	.52
3	.48	.52	.40	.48	.56	.48
2	.52	.32	.32	.32	.36	.36
1	.20	.24	.36	.12	.08	.20
			Three Plants Per Hill			
7*	.56	.28	.64	.44	.12	.40
6	.68	.64	.88	.72	.24	.64
5	.92	.84	.88	.64	.28	.72
4	.88	.44	.92	.52	.28	.60
3	.32	.40	.48	.60	.32	.44
2	.72	.56	.28	.64	.24	.40
1	.36	.08	.12	.60	.24	.28

*Upper Trifoliate

Table 93. Chlorophyll Content in Trifoliates of York Soybeans at Flower Initiation Time when Grown in Hills 30 cm Apart

Trifoliate Height	Plant Sample Number 1	2	3	4	5	Average
	mg chlorophyll/g					
			One Plant Per Hill			
5*	1.00	.56	.84	.84	.64	.76
4	1.20	.56	1.12	1.08	.92	.96
3	1.16	.72	1.12	1.12	1.00	1.04
2	1.00	.40	.84	.76	1.12	.84
1	.56	.52	.56	.84	.96	.68
			Two Plants Per Hill			
5*	.84	.76	.60	1.08	.76	.80
4	1.00	.92	.44	.96	.72	.80
3	1.04	.96	.76	.68	.72	.84
2	1.12	.96	.76	.76	.72	.88
1	1.00	.64	.52	.64	.36	.64
			Three Plants Per Hill			
5*	.60	.32	1.04	1.08	.92	.80
4	1.28	1.04	1.36	1.24	.80	1.16
3	.64	.88	1.72	.76	1.08	1.00
2	1.04	.72	1.44	1.24	.92	1.08
1	.40	.16	1.28	.64	.28	.56

*Upper Trifoliate

Table 94. Chlorophyll Content in Trifoliates of Bedford Soybeans at Flower Initiation Time when Grown in Hills 15 cm Apart

Trifoliate Height	Plant Sample Number 1	2	3	4	5	Average
	mg/chlorophyll					
			One Plant Per Hill			
6*	1.06	.88	.56	.76	1.06	.86
5	1.32	1.18	.56	.96	.80	.96
4	1.36	.88	.70	1.08	.72	.95
3	.94	1.08	.70	1.10	.80	.92
2	1.12	1.24	.92	.74	.84	.97
1	.98	.82	.74	.62	.44	.72
			Two Plants Per Hill			
6*	.44	.94	.80	.48	.38	.61
5	.94	1.22	.92	.66	.40	.83
4	.94	.78	.70	.62	.80	.77
3	.90	1.06	.66	.56	.74	.77
2	.94	1.02	.62	.48	.38	.69
1	.42	.66	.32	.48	.36	.45
			Three Plants Per Hill			
6*	.48	.70	1.00	.58	.84	.72
5	.80	.68	1.26	.66	1.14	.91
4	.48	.54	1.28	.70	1.04	.81
3	.50	.74	.94	.40	.88	.69
2	.80	1.20	1.10	.60	.82	.90
1	.62	1.10	.88	.74	.70	.81

*Upper Trifoliate

Table 95. Chlorophyll Content in Trifoliates of Bedford Soybeans at Flower Initiation Time when Grown in Hills 30 cm Apart

Trifoliate Height	Plant Sample Number 1	2	3	4	5	Average
	mg chlorophyll/g					
			One Plant Per Hill			
6*	.60	.68	.42	.44	.62	.55
5	1.08	.60	.54	.56	.58	.67
4	.92	.80	.96	.68	.96	.86
3	.88	.70	.98	.68	.84	.82
2	.92	.68	.78	.78	.62	.76
1	.82	.26	.56	.56	.42	.52
			Two Plants Per Hill			
6*	.66	.38	.70	.74	1.14	.72
5	1.14	.54	1.18	1.06	1.20	1.02
4	1.04	.78	1.04	.62	1.44	.98
3	1.04	.62	.82	.98	1.38	.97
2	.80	.54	.92	.72	.90	.78
1	.74	.56	.68	.68	.94	.72
			Three Plants Per Hill			
6*	.24	.38	.70	.42	.88	.52
5	.58	.70	.94	.44	.96	.72
4	.74	.90	.92	.78	.92	.85
3	.72	1.00	.70	.66	.54	.72
2	.70	.98	.72	.46	.84	.74
1	.42	.84	.48	.32	.40	.49

*Upper Trifoliate

VITA

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