CONNECTICUT
AGRICULTURAL EXPERIMENT STATION
NEW HAVEN, CONN.

BULLETIN 185, JANUARY, 1915.

TESTS OF SOY BEANS, 1914.

CONTENTS.

CONNECTICUT AGRICULTURAL EXPERIMENT STATION.

OFFICERS AND STAFF.

BOARD OF CONTROL.

His Excellency, Marcus H. Holcomb, *ex-officio, President.*
Prof. H. W. Conn, *Vice President* ..... Middletown
George A. Hopson, *Secretary* ..... Wallingford
E. H. Jenkins, *Director and Treasurer* ..... New Haven
Joseph W. Alsop ..... Avon
Wilson H. Lee ..... Orange
Frank H. Stadtmueller ..... Elmwood
James H. Webb ..... Hamden

Administration.
E. H. JENKINS, PH.D., *Director and Treasurer.*
MISS V. E. COLE, *Librarian and Stenographer.*
MISS L. M. BRAUTLECHT, *Bookkeeper and Stenographer.*
WILLIAM VEITCH, *In charge of Buildings and Grounds.*

Chemistry.
Analytical Laboratory.
JOHN PHILLIPS STREET, M. S., *Chemist in Charge.*
E. MONROE BAILEY, PH.D., C. B. MORISON, B.S.,
C. E. SHEPARD, G. L. DAVIS, *Assistants.*
HUGO LANGE, *Laboratory Helper.*
V. L. CHURCHILL, *Sampling Agent.*
MISS E. B. WHITTLESEY, *Stenographer.*

Proteid Research.
T. B. OSBORNE, PH.D., *Chemist in Charge.*
MISS E. L. FERRY, M.S., *Assistant.*

Botany.
G. P. CLINTON, SC.D., *Botanist.*
E. M. STODDARD, B.S., *Assistant Botanist.*
MISS E. B. WHITTLESEY, *Herbarium Assistant.*
G. E. GRAHAM, *General Assistant.*

Entomology.
W. E. BRITTON, PH.D., *Entomologist; State Entomologist.*
B. H. WALDEN, B.AGR., *First Assistant.*
Q. S. LOWRY, B.SC., I. W. DAVIS, B.SC.,
M. P. ZAPPE, B.S. *Assistants.*
MISS F. M. VALENTINE, *Stenographer.*

Forestry.
WALTER O. FILLEY, *Forester; also State Forester and State Forest Fire Warden.*
A. E. MOSS, M. F., *Assistant Station Forester.*
MISS E. L. AVERY, *Stenographer.*

Plant Breeding.
—— ——, *Plant Breeder.*
C. D. HURRELL, *Assistant.*

Vegetable Growing.
HOWARD F. HUBER, B.S.

FIELD TESTS OF SOY BEANS, 1914.*

Bulletin 179 of this Station, issued in October, 1913, discussed briefly the nature and possible uses in this State of the Soy Bean. Some hints as to planting were given, as well as data regarding the composition both of the forage and the ripe beans.

THE USES OF THE CROP.

The uses of the crop may here be briefly restated.

It is a valuable catch crop. If winter grain, fall or spring sown clover, or grass seed fails, soy beans drilled solid like grain or in rows from 24 to 30 inches apart, just after corn planting, will yield a soiling crop rich in protein and serving the same purpose as alfalfa or clover. By growing both early and late maturing varieties, perhaps also by successive plantings of a single variety, the crop may be used for feed from late July till heavy frost.

It is an excellent nitrogen-gathering green manure crop in orchards. Drilled the first of June and cultivated twice it makes a rank growth and can be turned under in time for sowing a winter cover crop. This year the mature crops of different varieties carried from 100 to 183 pounds of nitrogen per acre. What part of this nitrogen came from the air it is of course impossible to determine. The average crop of soy beans in 1914 furnished about 4500 pounds of dry organic matter and 135 pounds of nitrogen. This is about as much organic matter as is carried in seven tons of New York stable manure and as much nitrogen as in nine and a half tons.

As a seed crop it is sometimes profitable, depending on the state of the market.

*The field work connected with these tests was planned and carried out by Mr. H. K. Hayes and his assistant, Mr. Hubbell. The chemical analyses were made under the direction of the chief chemist, Mr. J. P. Street. The results have been prepared for publication by the director.

As a silage crop it has been used successfully, putting into the silo one load of soys to two or three of corn. It should not be silaged by itself nor can it be profitably planted with corn in hills or drills.

For hay, varieties with tender stems must be grown. It will probably be rather difficult to cure in our climate and may be rather coarse for dairy food, but is about equal, so far as chemical analysis indicates, to alfalfa hay.

Several stations make very favorable reports of the feeding value of soy bean forage and soy bean pasture (for hogs) and of the value of soy bean seed as a concentrate in comparison with cotton seed meal and linseed meal.

Cow peas have about the same season of growth as soy beans and are more used in the Southern States as a green manure or for feeding. Soy beans, however, seem better suited to Connecticut conditions for the following reasons:

They are more resistant to drought and heat and also to frosts than are cow peas, hence better suited to our light, sandy soils. Where both crops do well, tests in Indiana and Tennessee indicate that in the yield of green forage there is no great difference, though the soys yield much more seed. The soy is upright in habit, the cow pea recumbent and hence harder to cut and handle. The seed of the soy is a much more concentrated feed than that of the cow pea. The seed of the former ripens at one time while that of the cow pea does not and is harder to thresh.

TESTS MADE IN 1914.

During the past season further tests of this crop have been made which are here briefly summarized. Their chief object was to observe the characters of several varieties and their periods of growth, in order if possible to suggest to those interested a number of varieties which could be planted at the same time but which would mature in succession and provide a continuous supply of green feed rich in protein from late July or early August until frost. Nineteen varieties have been thus tested.

The land, which had been set with apple trees forty feet apart each way and now in their fourth year, was dressed as usual in the spring with 150 pounds each of nitrate of soda and muriate of potash and 300 pounds each of tankage and acid phosphate and was inoculated by sowing on it, with a fertilizer distributor, soil from a field where soy beans had been grown for two years.

The field was cultivated till May 28th, when the soy beans were drilled in rows two hundred feet long and 30 inches apart, the single plants standing about 3 inches apart in the row. Three rows of each variety were planted in this way.

These crops were cultivated twice but not after July 1st. Sufficient rain fell in the spring and early summer to give the crops a favorable start and they did not suffer visibly from lack of water at any time, although in September the drought was so severe as to noticeably affect the growth of ensilage corn.

The Yield of Fresh Forage.

Table 1 gives the data regarding the crops cut for green forage. The sources of the seed planted are as follows:

Nos. 1 and 2, selections from Professor Klinck, Macdonald College, Quebec. Quebec 537 looks like an early maturing strain of Ito San.

No. 3 from the Massachusetts Station, believed by Professor Brooks to be the same as Ito San.

No. 9 from the Ohio Station, came originally from Professor Brooks of the Massachusetts Station.

No. 6 grown by us last year from seed sent by L. P. Nemzek, Gibbsboro, N. J., who reported that it was imported from Manchuria in 1911 and grown in Kentucky in 1912.

No. 4 from Mr. Nemzek.

No. 5, 7, 8, 14, 17 from the New Jersey Station.

No. 12, 13, 15, 18, 19 from the Delaware Station.

Each variety was cut when the pods were well formed and the lower leaves were beginning to yellow. Soon after this yellowing begins leaves will fall rapidly and the value of the crop as forage declines at the same rate.

TABLE I. ANALYSES OF SOY BEAN FORAGE

No.	VARIETY.	Data Regarding Growth.			Percentage Composition as Harvested.					
		Height of Plants. Inches.	Days to Blossom.	Days to Maturity.	Water.	Ash.	Protein.	Fiber.	Nitrogen-free Extract.	Fat.
1	Quebec, No. 92	25	52	104	78.3	2.0	4.1	4.9	8.8	1.9
2	Quebec, No. 537	30	57	110	72.5	2.4	5.1	7.0	11.1	1.9
3	Medium Yellow	42	62	116	73.9	2.6	5.0	6.5	10.3	1.7
4	Ito San	40	62	116	70.3	2.6	5.0	7.8	12.3	2.0
5	Ito San	40	62	116	72.7	2.3	5.0	7.5	10.3	2.0
6	Kentucky	45	66	118	71.9	2.4	5.0	7.0	11.9	1.8
7	Manhattan	42	62	118	70.4	2.5	5.5	7.5	12.0	2.1
8	Ebony	44	66	118	69.8	2.6	5.6	8.4	11.9	1.7
9	Medium Green	45	67	120	59.7	3.3	6.9	12.0	15.5	2.6
10	Mongol*	48	74	124	69.3	2.6	3.3	11.2	12.4	1.2
11	Mikado*	42	74	124	76.8	1.9	2.7	7.3	10.1	1.2
12	Peking	40	84	124	65.3	3.0	5.2	11.9	13.2	1.2
13	O'Kute	40	68	124	76.0	2.0	4.5	7.2	8.9	1.4
14	Wilson	50	66	124	61.9	3.2	7.1	12.0	14.0	1.8
15	Arlington	50	78	124	68.1	2.4	3.9	11.4	12.9	1.3
16	Hollybrook*	48	82	130	71.9	2.8	3.7	8.6	12.3	0.7
17	Swan	46	78	130	75.8	2.1	4.4	7.4	9.3	1.0
18	Morse	52	75	130	73.7	2.7	5.0	7.4	10.1	1.1
19	Cloud	52	86	135	64.9	3.3	4.9	12.3	13.7	0.9
	Averages				**70.7**	**2.6**	**4.8**	**8.6**	**11.7**	**1.6**

*Yield reduced by unfavorable position in the field, excluded from average.

GROWN AT MT. CARMEL FIELD, 1914.

Percentage Composition, Water-free.					Yield in Pounds Per Acre.						
Ash.	Protein.	Fiber.	Nitrogen-free Extract.	Fat.	Total.	Dry Matter.	Protein.	Fiber.	Nitrogen-free Extract.	Fat.	Nitrogen.
9.1	19.0	22.9	40.2	8.8	15,106	3,277	624	749	1,317	287	100
8.6	18.7	25.6	40.1	7.0	17,980	4,936	923	1,265	1,986	345	148
10.0	19.0	24.9	39.8	6.3	21,100	5,511	1,049	1,369	2,194	348	168
8.8	16.8	26.2	41.4	6.8	15,655	4,643	778	1,218	1,922	315	125
8.4	18.2	27.6	38.6	7.2	13,200	3,602	657	994	1,389	259	105
8.6	17.7	25.1	42.1	6.5	17,624	4,947	876	1,243	2,087	319	140
8.4	18.6	25.5	40.4	7.1	21,240	6,287	1,166	1,606	2,536	448	186
8.6	18.7	27.7	39.4	5.6	19,428	5,865	1,094	1,624	2,308	332	175
8.2	17.0	29.7	38.6	6.5	12,938	5,208	886	1,550	2,007	340	142
8.5	10.8	36.6	40.3	3.8	11,395	3,498	377	1,280	1,410	134	. . .
8.2	11.8	31.4	43.6	5.0	5,389	1,247	148	392	544	62	. . .
8.8	15.1	34.5	38.1	3.5	15,271	5,277	797	1,820	2,008	183	128.88
8.2	18.6	30.2	37.0	6.0	15,996	3,845	717	1,160	1,422	230	115
8.3	18.5	31.4	37.1	4.7	14,793	5,639	1,044	1,769	2,095	265	167
7.4	12.1	35.8	40.6	4.1	19,063	6,077	738	2,175	2,465	250	118
10.0	13.3	30.5	43.6	2.6	14,241	4,000	531	1,222	1,742	104	. . .
8.7	18.0	30.8	38.3	4.2	19,306	4,668	842	1,440	1,784	195	135
10.1	18.8	28.0	39.0	4.1	16,291	4,283	806	1,197	1,670	178	129
9.3	13.9	35.1	39.2	2.5	16,187	5,672	787	1,991	2,224	142	126
8.8	**16.4**	**29.3**	**40.0**	**5.5**	**16,949**	**4,984**	**860**	**1,488**	**1,963**	**277**	**139**

The acre yields are calculated from the weight of crop on an accurately measured portion of a row, usually about 100 feet. This equals 1/174 of an acre. It is but a small fraction of an acre, and the rows were not duplicated. The yields given in the table, therefore, may not represent very closely the relative productiveness of the several varieties. Reference to the table which gives the acre yields, with the analyses from which they are calculated, shows that the yields of fresh forage ranged from 6½ to 10½ tons per acre and averaged about 8½ tons. In the same year the fresh forage from seven different varieties of ensilage corn raised at Granby on the farm of M. C. Hayes, planted May 28th and cut September 7th, ranged from 17.9 to 26.4 tons, averaging 21½ tons, per acre and at Mt. Carmel from 17.3 to 24.6 tons, averaging 19½ tons per acre.

The Yield of Dry Matter.

The soy beans yielded from 1.6 to 3.1 tons per acre of dry matter, the average being 2½ tons, while the corn at Granby yielded from 3.9 to 5.0 tons, averaging 4.3 tons, and at Mt. Carmel, from 3.4 to 6.7 tons, averaging 5 tons per acre.

These figures indicate that ensilage corn may be expected roughly speaking to yield two and a half times as much fresh forage and twice as much dry matter per acre as soy bean forage.

A brief notice of the yields of corn planted in another part of the State (Granby) may be of interest here and will be more fully discussed in a future publication. In 1913 Mr. Hayes gave the land a fair dressing of yard manure and grew a fine crop of ensilage corn. In 1914 the field received 1,000 pounds of a commercial corn manure before planting the varieties named below. Three rows each of seven varieties were planted May 28 side by side, the rows three feet apart and carefully thinned to an even stand of two plants every 18 inches. The whole field was cultivated alike. On September 8th the crop was harvested. All varieties were in the milk stage except Funk's Silver King, which was scarcely as

far advanced, and Eureka in which the ears had formed but had not yet developed kernels. From the center row the crop was cut from exactly 100 feet, carefully weighed and analyzed.

In this region frost is looked for by the second week in September.

The varieties, with the acre yields in tons of fresh forage and of dry matter were as follows:—(The average yield of each ingredient is given in Table II.

Gelston's Ensilage	22.85	5.03
Howe's Conn. Dent	20.33	4.58
Brewer's Dent x King Phillip	20.73	4.47
Brewer's Dent	20.32	4.20
Eureka	26.40	3.99
Funk's Silver King	22.60	3.94
Funk's Ninety Day	17.90	3.94

The seed of these varieties was from the following sources: Gelston's Ensilage from William I. Gelston, East Haddam; Howes' Conn. Dent from C. L. Howes, Stamford; Brewer's Dent × King Phillip, a first generation cross made at this station; Brewer's Dent from N. Howard Brewer, Hockanum; Eureka from Ross Bros., Worcester, Mass.; Funk's Silver King and Ninety Day from Funk Seed Co., Bloomington, Ill.

The Yield of Food Ingredients.

In the following table are given the average number of pounds per acre of food ingredients from sixteen varieties of soy beans, from the seven varieties of ensilage corn grown by Mr. Hayes, at Granby, and from a year's yield, three cuttings, of alfalfa, grown by Mr. C. M. Jarvis, of Berlin, which was weighed and analyzed by the Station from a measured acre of land.

TABLE II. AVERAGE YIELD OF CROPS NAMED IN POUNDS PER ACRE.

	Soy Beans.		Fodder Corn.		Alfalfa.	
	Total.	Digestible.†	Total.	Digestible.†	Total.	Digestible.†
Mineral matter,	433	. .	451	. .	692	. .
Protein,*	860	670	558	346	1320	976
Fiber,	1448	652	2219	1420	2276	978
Nitrogen-free Extract,	1963	1511	5233	4029	3133	2255
Fat,	277	152	157	119	167	167
	4981	2985	8618	5914	7588	4376
*Containing Nitrogen.	138		89		217	

†The percentage amounts of protein, fiber, nitrogen-free extract and fat which are calculated digestible are in soy beans, 78, 43, 77 and 55; in fodder corn, 62, 64, 77 and 76; in alfalfa, 74, 43, 72 and 59, respectively.

Period of Growth.

Table 1 gives the number of days which elapsed between planting and appearance of the first blossoms, as well as the number of days from planting to the time when the leaves began to yellow and the seeds were nearly full grown but still soft. Probably at this latter time the yield per acre is greatest, though the *per cent.* of protein would be somewhat greater a little earlier.

Under our conditions the crop is in good shape to feed green from the time of blossom on to full maturity. Quebec 92 planted May 28th could be used for soiling from the last week of July, that being the very earliest variety to mature (among the tested varieties) and it would quickly lose its leaves, and proportionally its feeding value, after the first week in September. Quebec 537 is very little later. Next come Medium Yellow, Ito San, Manhattan, Ebony, O'Kute, Wilson, and Medium Green, which could be fed from about the first of August to the middle of September.

In the next group are Morse, Swan, Arlington, Mikado and Mongol ready to feed by August 15th and lasting, weather permitting, till October 1. Lastly come the late varieties—Hollybrook, Peking and Cloud. Hollybrook has matured and ripened its seed perfectly for the last two years, in which killing frost was late in coming. In this State it probably cannot be depended on for seed every year, but is an excellent variety for soiling. It will be noticed that Hollybrook, Mongol and Mikado gave but a very small yield, being grown on a poorer soil and more shaded.

The Soy Bean Seed.

Of the three rows of each variety, the middle row was carefully thinned as soon as the seedlings appeared, so that the plants stood about three inches apart in the row. From a carefully measured portion of this row the mature vines were pulled, separately stacked and later threshed in a Koger thresher and the seed weighed. The general habit of the different varieties may be described as follows:

TABLE III. COMPOSITION AND YIELD OF SOY BEAN SEED, GROWN AT MT. CARMEL FIELD, 1914.

VARIETY.	Percentage Composition of the Dry Matter of the Seed.					Yield, Bushels Per Acre at 12% Moisture.	Weight of 100 Seeds.
	Ash.	Protein.	Fiber.	Nitrogen-free Extract.	Fat.		
Quebec, No. 92	5.8	42.5	4.0	28.7	19.0	26.7	21.8
Quebec, No. 537	6.3	45.0	4.1	27.6	17.0	27.7	16.3
Medium Yellow	5.2	45.5	4.2	28.1	17.0	27.9	16.6
Ito San (New 3 weeks)	5.3	44.4	4.3	28.5	17.5	26.2	15.6
Ito San (New Jersey)	5.5	43.7	4.3	29.6	16.9	27.8	. .
Kentucky	6 1	40.6	4.9	29.8	18.6	30.9	16.8
Manhattan	8.6	45.2	4 1	26.2	15.9	26.7	17.0
Ebony	5.7	45.1	5.8	27.8	15.6	24.2	11.5
Peking	7.0	41.9	6.5	30.1	14.5	14.8	5.1
Medium Green	5.4	45.2	4.5	27.3	17.6	27.0*	13.7
O'Kute	6.5	42.9	5.2	27.8	17.6	32.5	20.3
Wilson	5.7	41.5	6 4	30.6	15 8	18.5	8.3
Arlington	5.8	39.0	6.4	32.8	16.0	15.0	4.9
Swan	7.6	43.5	5.2	29.2	14.5	13.5†	13.0
Morse	5.2	41.9	5.5	31.6	15.8	17.0†	14.2
Cloud	6.3	41.4	6.0	32.2	14.1	7.8†	4.2
Mikado	5.9	36.8	5.6	32.9	18.8	7.6†	10.6
Mongol	6.6	39.5	6.1	30.0	17.8	14.9†	10.7
Hollybrook	6.3	42.8	4.8	31.6	14 5	. . .	10.6
Averages	**6.2**	**43.1**	**4.9**	**29.2**	**16.6**	. . . . .	. . . . .

* Estimated. † The seed bundles were damp at threshing time and yields are low because of imperfect threshing.

Erect; Quebec No. 92, Peking, Medium Green, O'Kute, Mikado, Mongol, Hollybrook. *Nearly or fairly erect;* Quebec No. 537, Medium Yellow, Ito San, Wilson, Arlington, Swan, Morse. *Erect but falls easily*; Manhattan, Ebony. *Twining habit,* thin stems; Cloud.

The color of seeds may be described as follows:—

Yellow, uncolored eye; Quebec No. 537, Medium Yellow, Ito San, Manhattan. *Yellow, brown or black eye;* Quebec No. 92, Swan, Mikado, Hollybrook. *Greenish yellow;* O'Kute. *Dark Green, black eye*; Medium Green. *Olive green*; Mongol. *Light yellow;* Morse. *Black;* Ebony, Peking, Wilson, Arlington, Cloud.

Regarding color of blossoms; Hollybrook and Morse were white, Kentucky, Peking Arlington and Swan were purple white and all other varieties named in the table were purple.

The results of the seed examination appear in Table III.

The weights of 100 dried seeds of each variety give an idea of their relative size. The table also shows the composition of the dry matter of the seed and the calculated yield in bushels (60 pounds) of seed containing 12 per cent. of moisture.

Yield of Seed.

The last column but one of the table gives the calculated yield per acre in bushels. The yields of five varieties were very low because they were imperfectly threshed. Ebony, Peking, Wilson and Arlington, as the last column shows, are small seeded and would not be grown for the feeding value of the seed. The yield of Medium Green is somewhat uncertain. Excluding these 9 varieties, the average yield of the 9 varieties which had seed of medium to large size is 28.1 bushels.

The Feeding Value of the Seed.

Table III gives the average composition of the dry matter of the seed.

Table IV gives the average composition and digestible matter of soy beans, cotton seed meal and new process linseed meal, as determined by analyses made at this Station and calculated to a uniform content of 10 per cent. of moisture.

TABLE IV. COMPOSITION AND DIGESTIBLE NUTRIENTS OF SOY BEANS, COTTON SEED MEAL AND LINSEED MEAL.

	Soy Beans.		Cotton Seed Meal.		Linseed Meal, N. P.	
	Total.	Digestible.	Total.	Digestible.	Total.	Digestible.
Water,	10.0	. .	10.0	. .	10.0	. .
Ash,	5.5	. .	6.4	. .	5.8	. .
Protein,	38.8	35.3	41.3	34.6	37.1	31.2
Fiber,	4.4	1.4	7.5	2.6	8.5	6.2
Nitrogen-free Extract,	26.4	20.1	26.0	20.2	35.9	28.7
Fat,	14.9	13.5	8.8	8.2	2.7	2.4
	100.0		100.0		100.0	
Nitrogen,	6.2		6.6		5.9	
Phosphoric Acid,	1.8		3.1		2.2	
Potash,	2.1		1.8		1.5	

The table shows that soy beans contain about the same amount of digestible feed as cotton seed meal, with the exception of five per cent. more of digestible oil.

Soy beans are as concentrated a feed stuff as we have, probably about as valuable for feed as cotton seed meal. A good crop of soy beans, 30 bushels to the acre, would yield as much concentrated feed as 1800 lbs. of cotton seed meal, costing somewhere about $29.70 at present prices. At present soy bean seed sells for about $1.50 per bushel, which would bring $45.00 for the 30 bushels of seed.

Resistance to Frost and Time of Planting

Last year the Hollybrook variety stood in the field until near the end of November and there were hard frosts before its seed got hard, yet it ripened perfectly and the seed was used for planting this year.

This year the same variety was frosted in September so that the upper leaves of the plants were killed but the crop matured perfectly.

In the Country Gentleman of August 2, 1913, a correspondent reports volunteer seedlings of the Wilson variety from seed of a previous crop which had lain in the ground all winter and was not injured by spring frosts.

The same correspondent also reports April plantings which were struck by an unusually hard frost May 11, which killed the leaves, but within a week new leaves started and made a good growth which was cut for hay in September. He claims that soy beans can be planted at any time from the middle of April—oat planting time—to July 1. There is no great difference in time of maturing between early and late plantings, but the former give the larger yields.

When to Plant.

Not later than July 1st and probably at corn planting time. In view of our experience with the Hollybrook variety and the statements of others regarding the hardiness of soy beans, we plan to try seedings of Hollybrook every two weeks through May and June, but cannot recommend planting earlier than corn.

How to Plant.

The best distance of planting will depend of course on the variety, the character of soil, etc. The best yields reported recently in tests made in different parts of Ohio were from seed drilled 21 to 28 inches apart, using three to four pecks to the acre.

The Indiana Station found that rows 24 to 28 inches apart gave better results than wider planting. The average of nine years' tests showed the highest yield of seed and the most hay where the beans were drilled solid, using 60 lbs. of seed to the acre. For this method the ordinary grain drill is used, set for 1½—2 bushels of oats. This will require 1—1½ bushels of soy beans of the usual size.

In drilling in rows, set the drill for 2-2½ bushels of oats per acre, which will take about 25—30 lbs. of soy beans of the ordinary size.

Varieties to Plant.

A single year's test is of course quite inadequate to determine which varieties are the most promising or profitable. After our two years' observation of the growth and frost-resistance of Hollybrook variety, we believe it is quite safe to recommend it to any one who wishes to try growing soy beans for either soiling, hay, or green manure. In a favorable season it will certainly ripen seed also in the southern part of the State. Until we have tested further we should recommend planting not earlier than corn, nor later than June 15th.

We wish to have this variety tested in different parts of this State with reference to its yield of green forage or hay, time of maturity and, if possible, its value as feed, and shall be glad to supply seed enough for a half acre or more to a limited number of persons who will test it carefully and report results fully.

To sum up a single year's observations of the nineteen varieties tested, all of which were planted on the 28th and 29th of May, in each of the following lists the varieties are named in order of their yield of forage, the highest yield coming first.

The earliest varieties—Manhattan, Medium Yellow, Quebec and Ito San bloomed in from 55 to 60 days and could be

cut for soiling. Their average yield when the foliage was mature was 2.35 tons of dry matter.

The next group of varieties, blossoming between 62 and 75 days, was Ebony, Wilson, Medium Green, Kentucky and O'Kute. These when mature had an average yield of 2.48 tons dry matter.

The later varieties, blossoming between 78 and 86 days—Arlington, Cloud and Swan—yielded an average of 2.83 tons.

The Hollybrook, as we have noted, was planted in an unfavorable place and its yield cannot be directly compared with that of the others. We are satisfied, however, that under uniform conditions it yields at least as much as most of the varieties tested.

A prominent dairyman of this State, who planted the Hollybrook variety in 1914 as a summer soiling crop, reports that while he has no data as to yield, etc., the feed was relished by his dairy herd and was very satisfactory in its effect on the milk yield.