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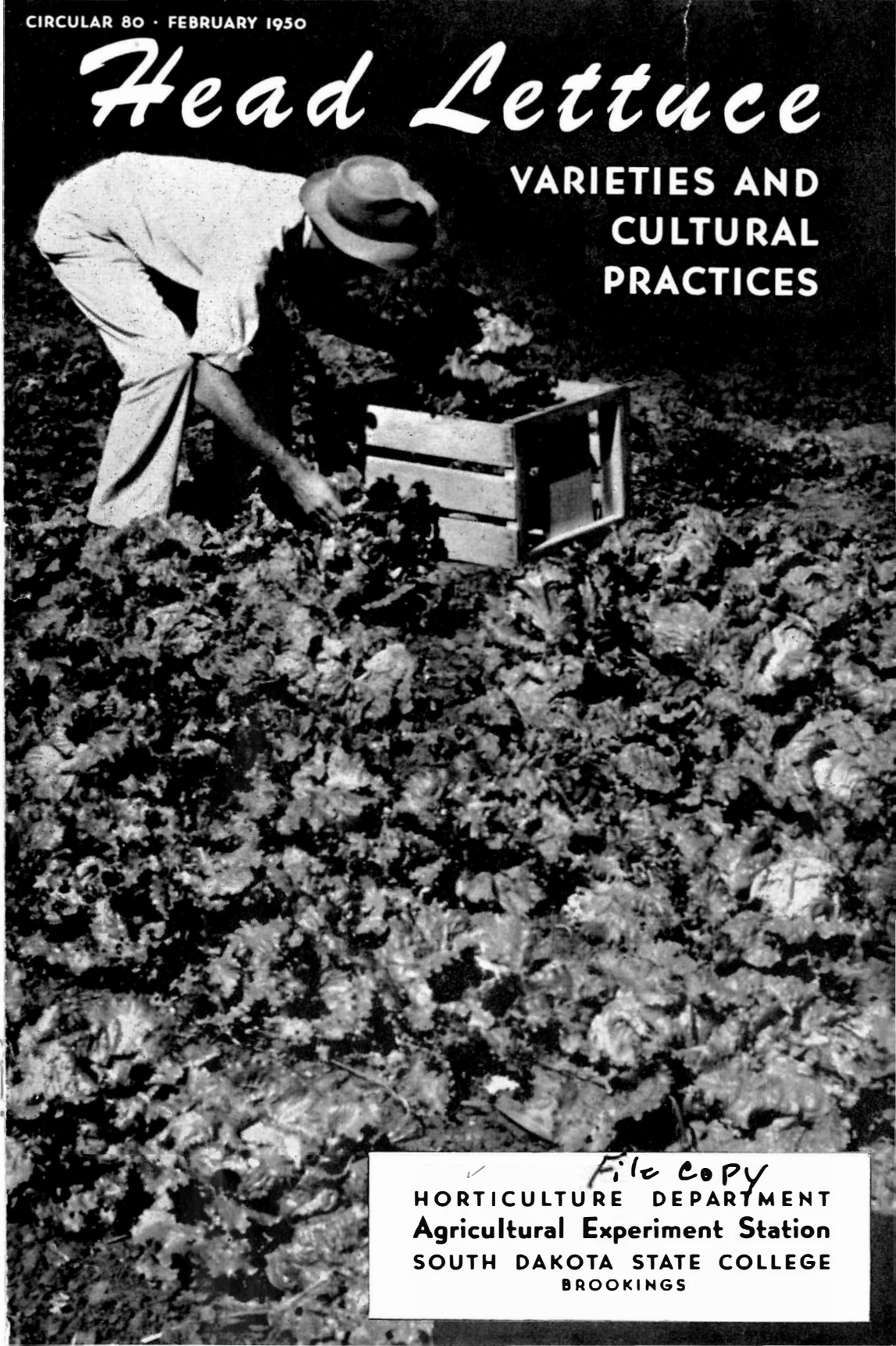

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HORTICULTURE DEPARTMENT
Agricultural Experiment Station
SOUTH DAKOTA STATE COLLEGE
BROOKINGS

Head Lettuce

VARIETIES AND CULTURAL PRACTICES

By S. A. McCrory[1]

Head lettuce is a crop that would have greater possibilities in South Dakota if its limitations were better known. One of the main problems in growing head lettuce is the selection of a quick heading variety of good quality and good yield If the plants are grown at temperatures above 80° F., they tend to send up seed stalks instead of heading. Soft rots also develop at temperatures above 80°.

This circular reports the results of a test of standard varieties and strains, as well as the investigation of plant growing practices that would encourage maximum heading of lettuce varieties before temperatures exceed 80° F. Also reported is the influence of fertilizers and manure in hastening maturity.

By starting lettuce seed indoors March 15, April 1, and April 15, Snyder (1) was able to mature plants 9 to 15 days earlier than field sown seed.

Preliminary work showed that seed sown March 15 and seedlings transplanted outdoors gave the largest harvest of heads when compared with later sown seed started both indoors and out (2). As a fall crop, head lettuce does not appear to be dependable.

Methods

Experiments were conducted at Spearfish and at Brookings. Lettuce grown for the Spearfish experiments was sown in the greenhouse at Brookings on March 30, transplanted to flats, and later shipped to Spearfish to be set in the field April 28. Manure, at the rate of 20 tons per acre, was applied to two of four replications of each variety being tested at Spearfish; the other two plots received no fertilizer. Seed was sown directly in the field on April 28, the seedlings were thinned to one foot spacing and all plants were harvested as the heads became hard. All plants were irrigated.

For the Brooking's experiments, the seed was sown March 15, first transplanting made March 27, and the plants set in the field May 4. In the variety test plot, the varieties and strains, New York 12, New York 515, New York P. W. 55, Great Lakes, Imperial 847 and Imperial 44 were compared. Six plants of a variety, per treatment, were included in a randomized planting of six replicates. Plants were spaced 12 inches in the rows, and the rows were 30 inches apart. These plants were also irrigated.

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Edward O. Olson and Leonard Yager conducted the work at the Spearfish station.

Fertilizer treatments were used as follows:

1. Wet fertilizer: One pound of 4-12-4[2] fertilizer was allowed to stand in 5 gallons of water for several hours. It was stirred occasionally. Just after the plants were set, a half pint of this solution was poured on the soil around the plant.

2. Dry fertilizer: A complete 4-12-4 fertilizer was applied dry around each newly set plant at the rate of 500 pounds per acre. Care was taken not to let the fertilizer come in contact with the roots of the plants. Plants were watered after setting.

3. Check: The newly set plants were watered but received no fertilizer.

[2]A fertilizer containing 4 percent nitrogen, 12 percent phosphoric acid and 4 percent potassium.

Results

Variety Test at Spearfish

New York 515 produced the greatest number of marketable heads, and a greater percentage of early maturing heads than the other two varieties. Imperial 847 ranked second in these respects. The Great Lakes variety was the latest to mature. New York 515 also proved to be superior to the other two varieties when the seed was sown directly outdoors. (See Tables 1 and 2.)

Comparisons Between the Use of Transplants and Direct Field Sowing—Spearfish

This experiment, conducted in the Spearfish valley, indicates the value of starting head lettuce seed indoors and later transplanting outdoors as soon as

Table 1. Earliness of Maturity of Three Varieties of Head Lettuce Grown From Month-Old Transplants and Field Seedings (Spearfish)

	Number of heads harvested Transplants					Number of heads harvested Field seeded			
Date of Harvest, July	[illegible]	[illegible]	10	14	16	Total	18	21	24	Total
New York 515	33	11	24	7	7	**75**	9	17	8	**34**
Imperial 847	13	12	23	17	2	**67**	**5**	6	4	**15**
Great Lakes	3	2	19	33	9	**66**		3	7	**10**

Table 2. Comparative Yield of Three Varieties of Head Lettuce When Grown From Month-Old Transplants and Field Seedings (Spearfish)

Variety	Number of heads harvested Tr.*	F.S.†	Number of unmarketable heads Tr.*	F.S.	Total weight of heads harvested Tr.	F.S.	Percentage of heads harvested Tr.	F.S.
New York 515	75	34	1	44	81.7	25.7	98.4	43.6
Imperial 847	67	15	4	63	68.1	14.5	94.5	19.0
Great Lakes	66	10	6	60	61.5	8.5	91.7	14.3

*Tr.—Month-old plants set in field April 28.
†F.S.—Seed sown directly in field, March 30.

Table 3. Effect of Manure Treatment on Earliness of Harvest of Head Lettuce Comparing Field Sown Seed with Month-Old Transplants (Spearfish)

	Number of head harvested Month-old transplants					Field-sown seed			
Date of Harvest, July 4	[illegible]	10	14	16	Total	18	21	24	Total
No treatment	21	9	41	61	8	**140**	2	11	6	**19**
Manure	35	23	38	35	4	**135**	17	23	17	**57**

Manure applications hastened the heading of both transplants and field-sown seeds as shown in Table 3.

the weather permits. A high percentage of the plants grown from transplants yielded over 90 percent marketable heads before hot weather set in (Table 2). Seed sown directly into the field ranged from stands of 14.3 percent to 43.6 percent of marketable heads from the three varieties.

The ability of the variety, New York 515, to produce a larger percentage of marketable heads in spite of field sowing is perhaps due to its earliness in heading. The same variety also proved superior to the others in yielding a greater percentage of marketable heads when transplants were used.

Variety and Fertilizer Test at Brookings

The New York 515 variety appeared to be best and earliest maturing. It gave the greatest percentage of marketable heads during the first and second harvests (Fig. 1). In fact, less than 10 percent of the crop remained after the second harvest for any treatment. New York 12 and New York P. W. 55 were slightly later, on the average, than New York 515. Great Lakes appeared to be next in maturity. Both the Imperial 44 and 847 were the latest to head.

As a general rule, the later maturing varieties produced the largest heads

Table 4. Number of Lettuce Heads Harvested (Brookings)

		Wet fertilizer		Dry fertilizer		Check	
	Date of harvest	Number of heads harvested	Percent of total harvest	Number of heads harvested	Percent of total harvest	Number of heads harvested	Percent of total harvest
New York 12	June 29	7	13.3	4	8.3	3	5.8
	July 5	13	38.6	13	41.4	16	46.8
	July 13	12	37.8	13	41.1	12	38.3
	July 21	3	10.3	4	9.2	5	9.0
Total		**35**		**34**		**36**	
New York 515	June 29	15	33.2	8	14.3	5	9.2
	July 5	20	63.0	19	69.4	20	63.0
	July 13	1	3.8	3	11.0	8	25.4
	July 21			2	5.3	2	2.5
Total		**36**		**32**		**35**	
Imperial 847	June 29	6	8.8	2	3.4	1	1.9
	July 5	10	33.1	7	19.5	5	20.8
	July 13	15	53.9	20	62.5	15	46.1
	July 21	2	4.2	7	14.7	12	31.2
Total		**33**		**36**		**33**	
Imperial 44	June 29	6	12.5	5	7.6	3	6.1
	July 5	9	25.6	16	45.1	12	44.1
	July 13	16	51.3	10	30.6	10	34.2
	July 21	3	9.6	7	16.6	5	15.6
Total		**34**		**38**		**30**	
Great Lakes	June 29	7	8.3	4	5.0	4	6.4
	July 5	15	45.8	8	21.8	9	25.0
	July 13	13	45.9	18	62.8	18	58.1
	July 21			5	10.4	4	10.4
Total		**35**		**35**		**35**	
New York P.W. 55	June 29	9	16.4	8	14.6	4	6.0
	July 5	19	64.5	20	67.7	15	45.5
	July 13	6	18.0	6	17.7	12	35.2
	July 21	1	9			5	13.4
Total		**35**		**34**		**36**	

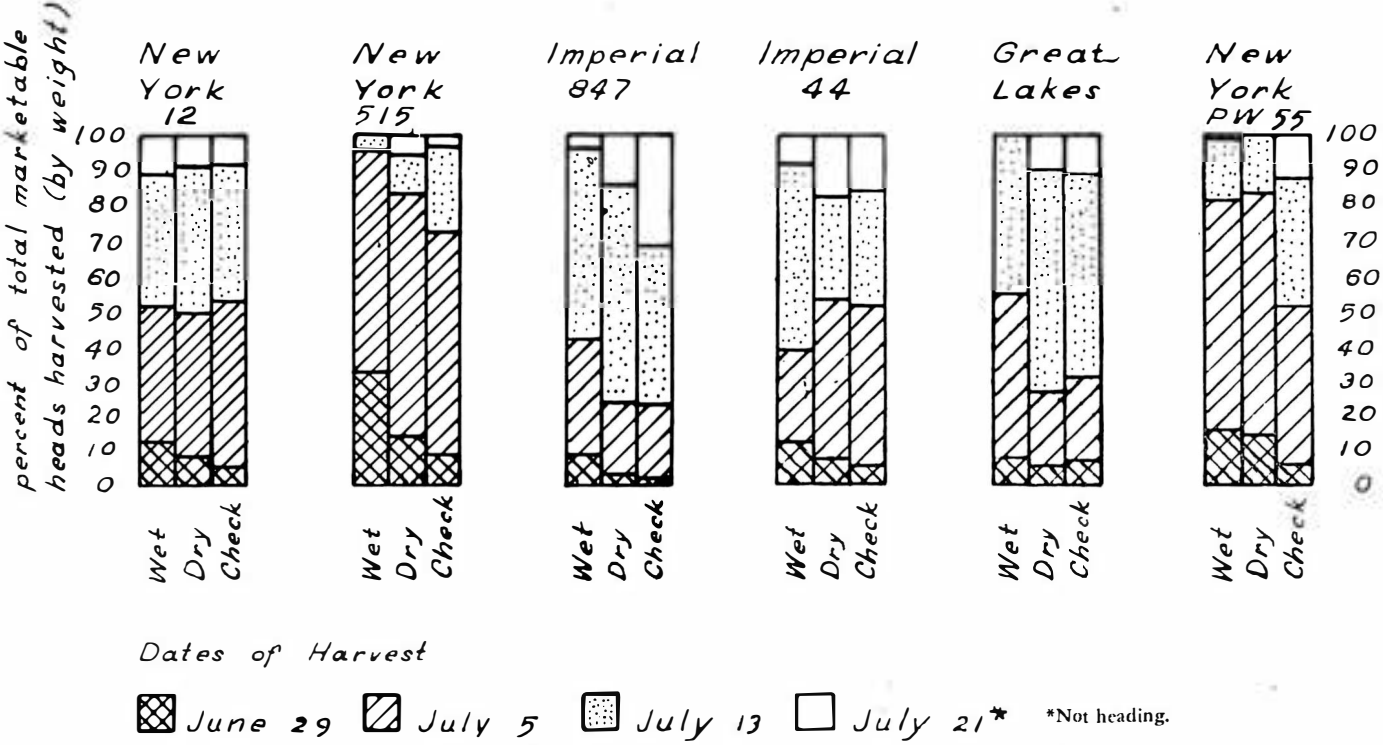

Fig. 1. Effect of wet and dry fertilizer application on the earliness of maturity for six head lettuce varieties and strains (Brookings).

(Table 5). New York 515 was slightly larger, on the average, in head size than the other two New York strains. Largest head size occurred, for the most part, from all varieties during the second and third harvest. The heads were appreciably smaller from the first and last harvest.

Fertilizer (4-12-4) helped to increase the yield of early heads. This was especially true for the first date of harvest. The response was not quite so pronounced in the case of some varieties and strains when the first two harvests were considered together. However, the trend was in favor of the fertilizer treatments. The variety, New York 515, gave the most marked response to fertilizer application for the first and second harvest. The use of fertilizer definitely brought about earlier maturity of heads with this variety.

The "wet" fertilizer appeared to be superior to the dry application in producing a greater percentage of earlier heads with all varieties. Four of the six varieties and strains produced a greater percentage of early heading.

Conclusions

New York 515 head lettuce appears to be the most promising early heading lettuce variety, to date, both at Spearfish and Brookings. The use of manure and commercial fertilizers aids in increasing the percentage of early, marketable heads. A commercial fertilizer applied in liquid form appears to be a little su-

Table 5. Average Weight per Head in Ounces at Each Harvest Date for Each Variety (Brookings)

Variety	Date of harvest	Wet fertilizer	Dry fertilizer	Check
New York 12	June 29	11.0	11.5	10.0
	July 5	17.2	17.7	15.2
	July 13	18.2	17.5	16.6
	July 21	20.0	12.8	9.4
	Average	**16.6**	**16.3**	**14.4**
New York 515	June 29	11.5	9.8	10.4
	July 5	16.4	19.9	17.9
	July 13	20.0	20.0	18.0
	July 21		14.5	7.0
	Average	**14.5**	**17.1**	**16.2**
New York PW55	June 29	8.8	9.4	8.5
	July 5	16.4	17.4	17.1
	July 13	14.5	15.2	16.6
	July 21	5.0		15.2
	Average	**13.8**	**15.1**	**15.7**
Imperial 847	June 29	9.5	10.5	10.0
	July 5	21.4	17.4	21.8
	July 13	23.3	19.6	16.1
	July 21	13.5	13.1	13.6
	Average	**19.6**	**17.4**	**15.8**
Imperial 44	June 29	11.2	10.0	9.3
	July 5	15.8	18.5	16.8
	July 13	17.1	20.1	15.6
	July 21	17.0	15.6	14.2
	Average	**15.7**	**17.3**	**15.2**
Great Lakes	June 29	7.1	8.0	9.2
	July 5	18.4	17.4	16.0
	July 13	21.3	22.2	18.6
	July 21		13.2	15.0
	Average	**17.2**	**18.2**	**16.4**

perior to dry application. For the highest percentage of marketable heads, it is necessary to start head lettuce seed indoors between March 15 and April 1, and transplant outdoors about the latter part of April. Outdoor seeding is, for the most part, not dependable.

Literature Cited

1. Snyder, Leon C. Lengthening the garden season and increasing vegetable yields. South Dakota Agricultural Experiment Station Bulletin 374. 1944.
2. McCrory, S. A. Unpublished data.