THE EFFECT OF FERTILIZERS ON BLUEBERRIES

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In a recent paper (1) the writer has shown the effect of certain fertilizers upon the yield of cranberries, in the course of experimental work conducted at Browns Mills, N. J., in 1919. A large blueberry plantation situated on the same property as the cranberry substation gave the writer an exceptional opportunity to observe the effect of certain commercial fertilizers applied to the blueberry. The blueberry (*Vaccinium corymbosum*) is a close relative of the cranberry (*Vacinium oxycoccus*). The commercial cultivation of the former is practically new, although the latter has been grown under artificial conditions for a half-century. The soil on which both plants are grown has a slightly acid reaction, and is usually more or less sandy and well irrigated.

Many papers have been published on the commercial culture of the blueberry by F. V. Coville, of the Bureau of Plant Industry, United States Department of Agriculture (2, 3, 4, 5,).

The blueberry plantation at Browns Mills is 4 to 5 years old. Early in the spring of 1919 the plants started slowly with a starved yellow appearance, and the large set of fruit buds showed no probability of maturing fruit unaided. An application of plant-food suggested itself as a means of increasing the active leaf surface of the plant, thereby increasing the fruiting possibilities. The writer was asked to recommend a mixture which, in his opinion, would be the most economical. Because of lack of space for experiments, it was necessary to reduce the problem to a choice among three substances. Experience with the cranberry plant led the writer to believe that the question was whether a quick acting mineral fertilizer or a more slowly available mixture was best suited to the needs of the blueberry plant, and also how much the plant was in need of nitrogen. Basing the work on this judgment the writer planned an experiment of five plots, arranged and treated as in table 1.

The fertilizer applied on these plots was purposely put on in large amounts in order to get results which could be interpreted within the shortest possible time. At the end of 2 weeks a very great difference was noted in the plant growth. The proportion of leaf surface to fruit had increased in all the plots receiving plant-food. In plot 2 the leaves and new stems showed

[1] Paper No. 7 of the Technical Series, New Jersey Agricultural Experiment Stations, Cranberry Substation.

the dark green color peculiar to plots having an overdose of nitrogen. Plots 3 and 5 both showed more foliage than plot 4 and the general appearance of plot 5 seemed to be best. From these early indications the writer recommended an application of 600 pounds of a mixture similar to that on no. 5. Throughout the year plots 3 and 5 had an exceptionally good appearance, growing larger and having larger berries than plot 4.

TABLE 1

Fertilizer treatments per acre on blueberries

PLOT NUMBER	TREATMENT
1	Nothing
2	250 lbs. nitrate of soda
3	250 lbs. nitrate of soda 750 lbs. acid phosphate 250 lbs. Nebraska potash
4	Nothing
5	170 lbs. nitrate of soda (15.20 per cent N) 230 lbs. dried blood (13.2 per cent N) 340 lbs. steamed bone (2.50 per cent N; 22.90 per cent P_2O_5) 340 lbs. phosphate rock (26.90 per cent P_2O_5) 170 lbs. Nebraska potash (28.5 per cent K_2O)

The yield in 1919 was not recorded because of lack of help at the bearing season. However, it was noted that individual berries on the plots receiving the fertilizer were much larger than on the check plots.

In the spring of 1920 the blossoms on plots 2 and 3 were so numerous that it was evident again that the bushes could not mature all the fruit. This was especially evident on plot 3. The bushes in plot 5, while they seemed to have a preponderance of blossoms over leaves, were in much better condition than those on plot 3.

The applications made in 1919 were repeated in 1920, except that plot 5 was divided into two parts and only half of the plot received the treatment. This made 6 plots. The crop yields were taken on three rows, each a different strain of blueberry, and the yields of plots 5 and 6 were doubled in order to make their yield comparable to the yields of the other plots of twice their size.

The detailed crop record is given in table 2.

The plots show that the fertilizer treatment did not hurry the ripening of the berries in any great degree, as the rows matured quite evenly.

Table 3 presents the yields calculated on the acre basis.

The large yield of plot 1 over that of plot 4 is due to the fact that the plants in plot 1 are one year older than the plants in plot 4. Plots 5 and 6 have practically the same yield, or at least within the limits of experimental error.

This seems to indicate that the fertilizer applied last year is sufficient to last two years. The outstanding fact in the table, however, is that a well chosen fertilizer mixture increased the crop to a point three times as great as the yield of the nearest untreated plot.

TABLE 2

Yield of blueberries on experimental plots

	JULY 17	JULY 28	AUGUST 4	AUGUST 11	AUGUST 18	TOTAL
	qts.	*qts.*	*qts.*	*qts.*	*qts.*	*qts.*
Plot 1						
Row 1	2.00	2.30	1.00	0.50	None	5.80
Row 2	4.20	2.50	1.10	0.20	None	8.00
Row 3	5.00	5.00	1.40	0.20	None	11.60
To al						25.40
Plot 2						
Row 1	2.50	4.16	2.00	1.00	None	9.66
Row 2	2.80	2.65	0.90	0.15	None	6.50
Row 3	2.20	1.65	0.65	0.20	None	4.70
Total						20.86
Plot 3						
Row 1	3.00	2.00	2.15	2.15	2.00	9.30
Row 2	5.10	10.60	1.70	0.40	None	17.80
Row 3	6.30	1.90	1.30	0.30	None	9.80
Total						36.90
Plot 4						
Row 1	2.50	2.00	0.50	0.12	None	5.12
Row 2	2.70	2.30	0.90	0.10	None	6.00
Row 3	2.70	1.80	0.80	0.20	None	5.50
Total						16.62
Plot 5						
Row 1	5.50	11.00	4.50	3.00	1.50	25.50
Row 2	4.30	3.50	1.00	0.10	1.50	10.40
Row 3	8.00	5.00	1.60	0.20	None	14.80
Total						50.70
Plot 6						
Row 1	3.30	12.50	7.50	2.10	2.50	28.40
Row 2	3.50	4.00	1.00	0.10	None	8.60
Row 3	9.00	4.00	1.50	0.25	None	14.75
Total						51.75

The varieties represented in each row are: Row 1, Dunfee; row 2, Inman I; row 3, Inman II.

On August 10 the new growth started on all fertilized plots, in some cases being 8 inches long by August 18. This, of course, is of great advantage in setting buds for next year's crop. On August 21 none of the check plots had started new vine growth.

TABLE 3

Acre yields of blueberries on experimental plots

PLOT NUMBER	TREATMENT, 1919	TREATMENT, 1920	YIELD, 1920
			qts.
1	Nothing	Nothing	1016.0
2	250 lbs. nitrate of soda	Same as in 1919	834.4
3	250 lbs. nitrate of soda 750 lbs. acid phosphate 250 lbs. Nebraska potash	Same as in 1919	1476.0
4	Nothing	Nothing	664.8
5	170 lbs. nitrate of soda 230 lbs. dried blood 340 lbs. steamed bone 340 lbs. phosphate rock 170 lbs. Nebraska potash	Same as in 1919	2028.0
6	Same as plot 5	Nothing	2070.0

REFERENCES

(1) BECKWITH, CHARLES S. 1919 The effect of certain nitrogenous and phosphatic fertilizers on the yield of cranberries. *In* Soil Sci., v. 8, no. 6, p. 483–490.

(2) COVILLE, FREDERICK V. 1916 Directions for blueberry culture. U. S. Dept. Agr. Bul. 334.

(3) COVILLE, FREDERICK V. 1902 Blueberries. *In* Bailey's Encyclopedia of Horticulture, v. 4, p. 1889.

(4) COVILLE, FREDERICK V. 1911 Taming the wild blueberry. *In* Nat. Geogr. Mag., v. 22, p. 137–147.

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PLATE I

FIG. 1. Typical bush on plot 4, untreated.

FIG. 2. Typical bush on plot 6, treated with fertilizer in 1919.

FIG. 1.

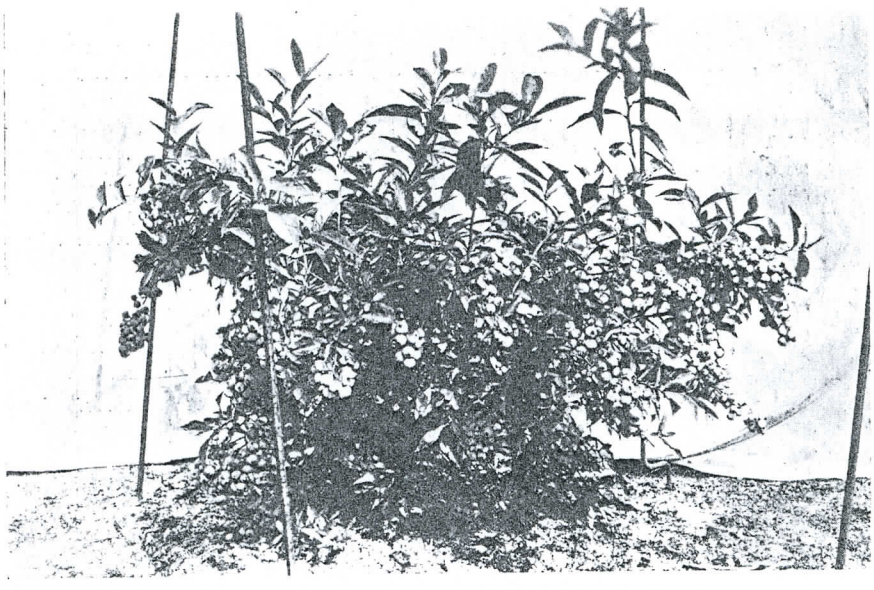

FIG. 2.