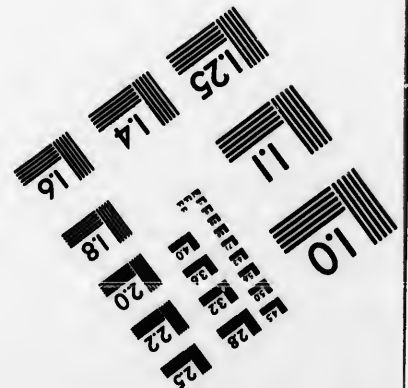
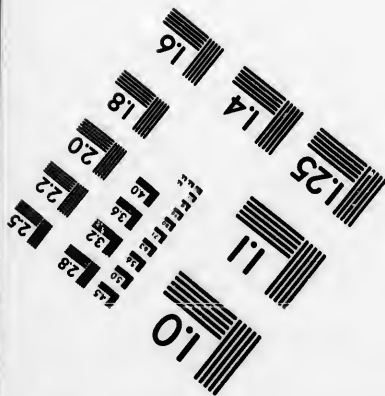
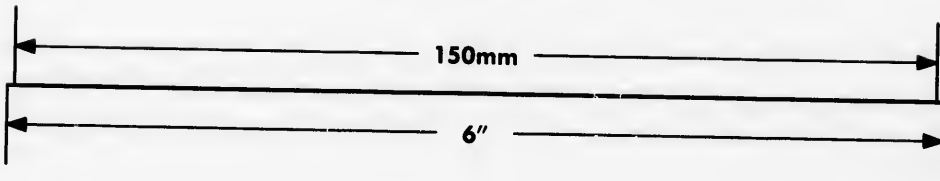
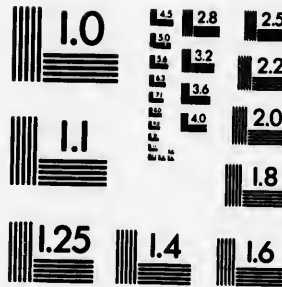
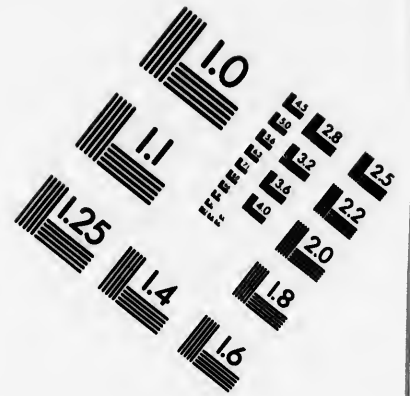
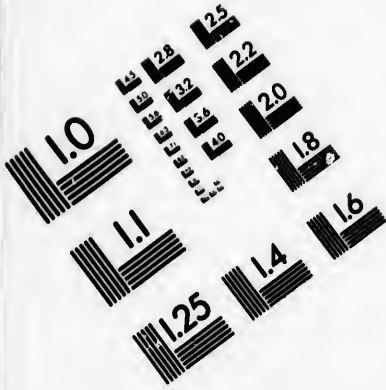


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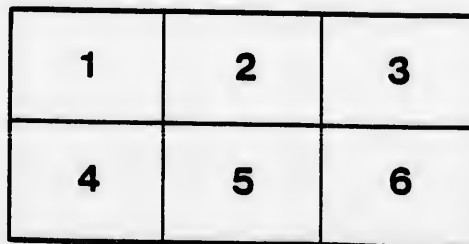
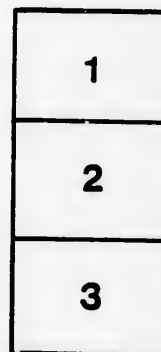
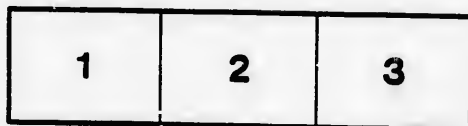
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ONTARIO AGRICULTURAL COLLEGE
EXPERIMENT STATION.

BULLETIN LXXXVI.

ROOTS, POTATOES AND FODDER CORN.

BY THOMAS SHAW, PROFESSOR OF AGRICULTURE, AND
C. A. ZAVITZ, B.S.A., EXPERIMENTALIST.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE

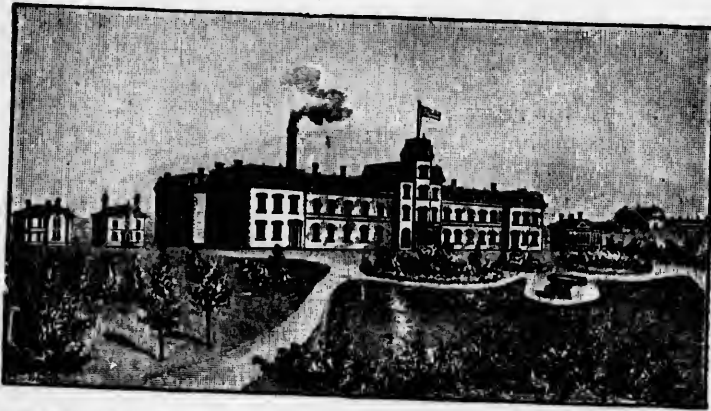
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BULLETIN LXXXVI.

ROOTS, POTATOES AND FODDER CORN.

The returns from the Bureau of Industries give the area of the root crop grown in 1892 as 161,594 acres with a yield of 77,719,476 bush.; that of the potato crop as 145,703 acres with a yield of 12,289,817 bush., and that of the fodder corn crop as 91,403 acres with a yield of 948,907 tons. The importance therefore of these crops to the farmers of this province amply justifies the attention that is being given to them by way of experiment at the station during recent years.

The following are the principal objects of this bulletin, viz.: (1) To give comparative results obtained from growing leading varieties of roots, potatoes and fodder corn side by side and under the same conditions for one year and in the case of some of them for a longer term; and (2) to give comparative results from growing fodder corn at different distances apart between the drills and also in the drills.

In 1892, 62 varieties of turnips, 38 of mangels, 23 of carrots and 10 of sugar beets were grown at this station and practically under the same conditions. Each plot was one one-hundredth of an acre in size. In all instances the drills were $3\frac{1}{2}$ links or 27.7 inches apart, and they were ridged. The soil was a clay loam; it had been in sod for a number of years and was broken up after the removal of the hay crop in 1890. Potatoes followed in 1891. Fresh farm-yard manure was applied in the winter of 1891-2 at the rate of about 15 tons per acre.

Swede Turnips. 44 varieties were grown. The seed was sown June 15th. The plants were thinned to an average distance of 12 inches in the drill. The following table gives the results from the 6 varieties which gave the highest yields:

Varieties.	Yield of tops per acre, 1892.	Average weight per root for two years.	Yield of roots per acre, 1892.	Yield of roots per acre, average two years.
	tons.	lb	tons.	tons.
1. White Swede	5.98	2.53	23.13	22.53
2. Hazard's Improved	5.00	2.70	19.50	21.31
3. Sutton's Champion	4.58	2.55	19.03	21.29
4. Our Selected purple top	3.90	2.49	19.45	21.20
5. Green top	6.18	2.44	21.36	21.05
6. Hartley's bronze top	4.00	2.37	17.96	20.95

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The White Swede which heads the list in point of yield for one year and for two years is short in the neck, large in size and firm in flesh. We learn from the co-operative experiments that Carter's Elephant, which did not get a place in the above list, gave satisfactory returns throughout the province.

White fleshed and Yellow fleshed Turnips: 18 varieties were grown. The plants were thinned to an average distance of 12 inches in the row. The seed was sown June 21st. These varieties are all white fleshed. The following table gives the comparative results from the 6 varieties which gave the highest yields :

Varieties.	Yield of tops per acre, 1892.	Average weight per root for two years.	Yield of roots per acre, 1892.	Average yield of roots per acre for two years.
	tons.	lb	tons.	tons.
1. Jersey Navet	4.35	2.91	21.33	24.81
2. Greystone	6.50	2.66	18.40	23.21
3. Red Globe Norfolk	4.68	2.73	17.78	23.24
4. Greystone Improved	8.18	2.10	16.20	23.74
5. Purple top Maine	6.53	2.71	19.33	22.71
6. Early American purple top	6.10	2.40	21.50	21.80

The Jersey Navet which heads the list was not so firm in flesh as the four varieties which come after it in point of yield. The Red Globe Norfolk is first amid the varieties grown for three years. The 10 white fleshed varieties averaged 21.8 tons per acre and the four yellow fleshed 15.4 tons.

Mangels. 38 varieties were grown. The plants were thinned to the average distance of 12 inches in the drill. The seed was sown April 30th. The table below gives the comparative results from the 6 varieties which gave the highest yields :

Varieties.	Yield of tops per acre, 1892.	Average weight per root for two years.	Yield of roots per acre, 1892.	Yield of roots per acre, ave- rage for two years.
	tons.	lb	tons.	tons.
1. Carter's Champion Yellow Intermediate..	4.93	2.72	25.78	29.94
2. Improved Mammoth Prize Long Red	4.45	2.33	20.65	28.11
3. Evans' Improved Mammoth Sawlog	4.23	2.44	21.35	27.65
4. Steele Bros.' Long Red Selected	4.40	2.41	21.03	27.18
5. Carter's Mammoth Long Red	6.25	2.42	25.80	26.49
6. Elvetham Long Red	6.00	2.29	27.20	28.37

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The yield from Carter's Champion Yellow Intermediate for two years was 998 bush. per acre. The Improved Mammoth Prize Long Red which stood at the head of the list in 1891 gave an average yield of 937 bush. per acre for two years. The Yellow Oberdorf, first in point of yield among the Globe varieties, is twelfth in the list of 31 varieties. The 13 distinctively long varieties gave a yield of 24.6 tons per acre and the 10 Globe varieties a yield of 18.8 tons.

Carrots. 23 varieties were grown. The plants were thinned to an average distance of 3 inches in the line of the drill. The seed was sown April 30th. The table below gives the comparative results from the 6 varieties which gave the highest yields in 1892 :

Varieties.	Labor in pulling.	Average weight per carrot.	Yield of tops per acre.	Yield of roots per acre.
1. Improved Short White		oz.	tons.	tons.
2. Pearce's Improved Half Long White	easy ..	15.6	10.2	37.3
3. Large White Vosges	" ..	15.6	10.2	36.5
4. White Green top Orthe	" ..	13.8	8.5	33.9
5. Simmer's Short White Vosges	" ..	14.3	7.8	32.6
6. Large White Belgian	hard ..	13.9	7.4	32.3
		13.9	9.5	31.3

The average yield of the 6 varieties in the table is 1,135 bush. per acre, and of 23 varieties grown 906 bush. per acre. The 7 best yielding varieties were all white and the 5 best yielding sorts were all easy to pull. The Improved Short White is a grand field carrot. It is of medium length, sound in flesh, smooth in shape and easy to harvest and handle.

Sugar Beets. 10 varieties were grown. The distance between the drills was the same as with the other varieties of roots, viz. : 27.7 inches apart. The plants were thinned to the average distance of 12 inches in the drill. The seed was sown April 30th. The following table gives the comparative results from the 6 varieties which gave the highest yields :

Varieties.	Uniformity of roots.	Yield of tops per acre.	Average weight per root.	Yield of roots per acre.
1. White Silesian	good	tons.	lb.	tons.
2. Red top	good	6.93	1.83	17.70
3. Vilmorin's Improved White	good	5.06	1.77	17.63
4. French White	medium..	7.13	1.68	16.28
5. Lane's Improved	medium..	2.83	1.63	16.25
6. Champion	good	3.23	1.53	16.20
	good	4.83	1.46	13.93

The White Silesian, which is more commonly grown for feeding purposes gave the highest yield, viz.: 17.70 tons or 590 bush. per acre. The six varieties gave an average yield of 16.33 tons, or 544.3 bush.

Potatoes. 118 varieties were grown. The plots were one one-hundredth of an acre in size. There were 2 drills in each plot and the drills were 27.7 inches apart. The soil was a light colored loam. It had produced hay for a number of years previous and was plowed just after the removal of the hay crop of 1891. No fertilizer of any kind was applied. The seed was planted May 14th. The same amount of seed was used and the tubers were planted one foot apart in the drill. The cultivation was practically flat. The table below gives a comparison of results from the 6 varieties which gave the highest yields.

Varieties.	Percentage of crop marketable.	Weight of	Yield per acre 1892.	Average yield per acre, 3 years, 1890-91-92.
		30 best developed potatoes.		
		lb.	bush.	bush.
1. Empire State.....	96.5	9.8	120.0	168.6
2. Summit.....	90.9	10.5	187.1	180.6
3. Thorburn.....	93.7	11.0	185.4	148.0
4. London.....	78.3	7.3	165.4	138.0
5. Clark's No. 1.....	88.5	7.8	127.1	134.3
6. Early Maine.....	77.1	6.3	112.9	131.6

The Empire State and the Summit at the head of the list in the above table, also head the list in the co-operative experiments carried on over the Province in 1892. Both varieties are good for the table. Tonhocks heads the list of 16 varieties grown for two years. It is a good potato for the table as is also the Convo which comes second in the list for two years.

Planting Fodder Corn in different ways. Triplicate tests were made with three varieties of Fodder Corn grown with drills different distances apart, and also different distances between the plants in the drill. The varieties used were the Mammoth Southern Sweet, Wisconsin Earliest White Dent and Compton's Early. In the absence of analyses the following conclusions have been reached, viz.:

1. That the best results were obtained from growing the Mammoth Southern Sweet in drills 42 inches apart and the plants 12 inches apart in the drill.
2. That with the Wisconsin Earliest White Dent, the best results were obtained with the drills 30 inches apart and 12 inches between the plants, and
3. That with Compton's Early the best results were obtained from corn grown with 30 inches between the drills and 4 inches between the plants in the drill.

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Fodder Corn. 64 varieties of fodder corn were grown at the station during 1891 and 1892. They were all planted upon duplicate plots each year. The seed was dropped in hills 5 links or 39.6 inches apart both ways. Seeding took place in 1892, on May 14th, with one set of plots, and on May 28th with the duplicate plots. Four plants were allowed to grow in each hill in 1891 and five in 1892. Thorough shallow cultivation was given the rows both ways.

The results from seven varieties which gave the highest yields for two years, are as follows :

Varieties.	Kind of Corn.	Condition of grain when harvested.	Yield of ears per acre when harvested.	Average yield of crop per acre 1891-1892.
Mammoth White Surprise.....	white dent...	water	lb.	tons.
Brazilian Flour	white flint...	water	1,894	22.2
Chester County Mammoth.....	yellow dent...	water	484	22.0
Mastodon Dent	yellow dent...	late milk..	2,340	20.9
Blunt's Prolific	white dent...	early milk..	5,717	20.0
Coud's Early Yellow	yellow dent...	dough	2,508	20.0
Thoroughbred White Flint.....	white flint...	dough	6,898	20.0
			8,494	19.9

The varieties mentioned in the above list, although heavy yielders, are somewhat late in reaching maturity. The Thoroughbred White Flint which has been grown at this station for several years and also distributed over Ontario for co-operative tests, has shown itself to be well suited to the southern portions of the Province. Of the earlier maturing varieties the Mammoth Coban, Salzer's South Dakota, Salzer's North Dakota, Wisconsin Earliest White Dent and Compton's Early have done exceedingly well. The Giant Beauty and the Silver Flint are very promising of the varieties grown for one year only.

CONCLUSIONS.

The following conclusions may be safely drawn from the different experiments summarised in the Bulletin :

- (1) That several of the most promising varieties of roots, potatoes and fodder corn are comparatively new in Ontario.
- (2) That the roots and potatoes grown for two years, mentioned in this bulletin, gave the following yields per acre: Mangels 920.4 bush., Fall Turnips 769.6 bush., Swede Turnips 712.9 bush. and Potatoes 149.7 bus.
- (3) That white fleshed turnips gave better yields than the yellow fleshed varieties; the long shaped Mangels better than the globe varieties; the white Carrots better than the yellow varieties and the dent corns better than the flint varieties.

(4) That, of the roots grown on the station plots for two years, the White Swede Turnip, the Jersey Navet Fall Turnip, the Carter's Champion Yellow Intermediate Mangel, and of those grown for one year only, the Improved Short White Carrot and the White Silesian Sugar Beet, gave the highest yields in their respective classes.

(5) That in the plot experiments at the station for three years with 32 varieties of potatoes and also in the co-operative tests over Ontario during 1892 with 6 varieties, the Empire State and the Summit varieties came first and second in point of yield.

(6) That, of the kinds of fodder corn tested, the Mammoth White Surprise, Giant Beauty, Thoroughbred White Flint, Mammoth Cuban, Wisconsin Earliest White Dent and Salzer's South Dakota are leading varieties among the late, medium, and early maturing classes.

(7) That when both yield per acre and stage of maturity are considered, the best results were obtained in 1892 by growing a large variety of corn with one plant to every 504 sq. in. a medium variety with one plant to every 360 sq. in., and a small variety with one plant to every 120 sq. in.

Circulars regarding the distribution of seed.

The seed of some of the leading varieties of roots and fodder corn will be distributed, by mail, free to the farmers of Ontario, through the medium of the Ontario Agricultural and Experimental Union. For circular giving necessary information apply to C. A. Zavitz, Experimental Station, Guelph, Ontario.

