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Experimental Union.

BEST VARIETIES OF GRAINS, ROOTS AND FODDER CROPS, AND HOW BEST TO CULTIVATE THEM.

The Ontario Agricultural and Experimental Union was held at the Guelph College on December 6th, 7th and 8th. There were over one hundred ex-students in attendance, besides a large number of experimenters and visitors. The first evening's programme consisted of addresses dealing largely with the history of the institution, which stretches back over twenty-five years. Notably among these was a review by Dr. Jas. Mills, similar to what he gave in our issue of Dec. 1st. Hon. Chas. Drury was also present, and gave a brilliant address, in which he praised the work of the president and referred to the growing public sentiment backing the work of the institution. He also praised Hon. Mr. Dryden's earnest efforts in behalf of the cause of agriculture.

Professor J. W. Robertson, Dominion Dairy Commissioner, speaking for the ex-officers, dealt with the relative merits of the Guelph College as compared with the agricultural colleges of France, Germany, and Great Britain, having visited the leading agricultural institutions of those countries, which he claimed are not to be compared to ours in equipment, staff and practical work accomplished. "The education gained at Guelph," he stated, "is not merely a gathering of information, but it is such as to fit one for the activities of common life." A course there, too, tends to bring about correct habits in those who pass through its halls. Touching references were made to ex-officers, referring more particularly to Professors Brown, Shaw, Hunt, and the late Prof. Pantou.

Prof. C. C. James, Deputy Minister of Agriculture for Ontario, spoke on the future of the institution. He said that success had crowned the efforts of the institution, as its foundation was laid strong, deep and well. Referring to the field for students in Ontario, the Deputy Minister stated that there are 180,000 families on the farms of Ontario, and on these there are approximately 300,000 boys. Of these, 40,000 to 50,000 are at a suitable age to enter the course. As a matter of fact, there are this year about 100 students in attendance—less than one per cent. of those the college is open for. In looking about for a means of reaching the 90 per cent. who cannot or do not come to the college, Prof. James took hope in the fact that agricultural teaching is to become a growing part of public school teaching. Other helps will continue to come from the Farmers' Institutes and from the example of ex-students in their respective localities. Prof. James would like to see the students go out from the institution prepared to take the Institute platforms and proclaim the truths of scientific agriculture. He could not speak with certainty regarding the future of the college, but he expressed the belief that an extension in the direction of domestic science would be advantageous to the institution and to the country.

Mr. John I. Hobson, Chairman of the Advisory Board, spoke of the College as the model after which a Scottish institution is being patterned.

Messrs. G. C. Creelman, B. S. A., Supt. of Farmers' Institutes; Nelson Monteith, B. S. A., M. P. P.; H. L. Beckett, B. S. A., President of the Experimental Union; and Prof. G. E. Day, B. S. A., gave brief addresses that were especially interesting to the ex-student body present.

During the two following days the time was very largely occupied with Mr. C. A. Zavitz's report of the twenty-three co-operative experiments carried out over the Province with fertilizers, and the various farm crops on 3,485 farms in 1899. From these farms 730 satisfactory reports had been received, from which the charts or tables used to illustrate his report were made up.

The following table shows the number of acres of the various crops grown in Ontario in 1899, the number of varieties of each tested on the O. A. C. in fifteen years, and the number tested in the co-operative experiments in 1899 over Ontario:

CO-OPERATIVE EXPERIMENTS.			
	Acres in Ont., '99.	At O. A. C., 13 yrs.	Var's tested over Ont., '99
Hay and clover.....	2,505,422	72	8
Oats.....	2,363,778	218	4
Fall wheat.....	1,049,691	135	7
Peas.....	743,139	100	5
Corn.....	505,025	226	6
Barley.....	490,374	95	4
Spring wheat.....	398,736	144	3
Potatoes.....	168,148	241	6
Turnips.....	153,440	183	4
Rye.....	137,824	6	1
Buckwheat.....	132,082	6	3
Mangels.....	53,401	102	4
Beans.....	40,850	11	6
Carrots.....	11,391	60	4

Pres. H. L. Beckett, in his address, referred to the unfavorable pasture season in many parts of the Province, and pointed out that the effect would be to force farmers to depend less on pasture and more on soiling crops during the dry months. The development of the co-operative experimental work was a matter for gratification, as it is of genuine help to the business of agriculture. All good varieties of crops are forcing themselves on the Union, so that their real merits will very soon become known. The benefits of experiments are of great personal advantage to those who conduct them, as

they open up new fields of investigation, develop observation, and become general eye-openers.

During Mr. Zavitz's discussion upon fertilizers, he pointed out that superphosphate applied to mangels gave larger returns than nitrate of soda, muriate of potash or complete fertilizer. He found in several instances that the increase of crops from the use of fertilizers was frequently insufficient the first year to warrant their use. Comparing the hairy vetch with the common vetch and grass peas, the hairy variety gave much the best returns in green fodder per acre. Of various mixtures of grains for green crops, oats one and a half bushels, with one bushel of peas per acre, gave better satisfaction to experimenters than oats, peas and tares, or oats and tares. Of millets, Japanese panicle gave an average in two years of 6.4 tons per acre, as compared with 5.9 tons of Japanese barnyard millet and 4.8 tons of Hungarian grass. This crop was strongly recommended to supplement corn, etc., as green fodder and as pasture in a dry time. Of the grasses, tall oat, timothy, orchard and meadow fescue, the first named gave three tons of hay per acre at the first cutting in the second year, as compared with 2.7, 2.0 and 2.1 tons of the others mentioned in the above order. Of clovers, Mammoth red clover produced 3.6 tons of hay per acre the second year at the first cutting, while common red gave 2.4; alsike, 2.4, and lucerne, two tons per acre. The Mammoth variety grows a coarser stem and is slower to cure than the common red. It is also almost two weeks later, but makes good hay when carefully made in favorable weather. Lucerne gives several cuttings a year, so that the above figures do not fairly represent its comparative value. Japanese buckwheat gave an average during the last three years over Ontario of 23.3 bushels per acre, as compared to Silver-hull at 22.4, and common gray at 21.4 bushels. Of Wellman's Fyfe, Rio Grande and Herrison's Bearded spring wheat, the first named gave an average return over Ontario of



SIDES OF TAMWORTH BACON HOGS AT ONT. PROVINCIAL FAT STOCK AND DAIRY SHOW, 1899.

The center side is excessively fat.

23.5 bushels per acre in 1899; Rio Grande, 20.5, and Herrison's Bearded, 19.3 bushels per acre. They also produced bulk of straw in the same proportion. Wellman's Fyfe produced the stiffest straw and is very similar, if not the same, as the old White Russian variety. Of barleys, Oderbrucker yielded 41.5; Mandscheuri, 38.7, and Success, 34.2 bushels per acre. Siberia oats stand well ahead of the next three sorts, having given 55.7; Bavarian, 53.6; Joannette, 51.8, and Poland White, 49 bushels per acre. Siberian produces a stiff straw, and in 1898 averaged 1.7 tons per acre.

The report and discussion on peas brought out much information, owing to the value of the crop and the danger that threatens it from the pea bug (*Bruchus pisi*). So bad has this pest become, in some districts pea-growing is threatened with destruction. The heaviest yielder this year over Ontario was Early Britain, producing 28.1 bushels per acre and 1.2 tons of straw; Chancellor gave 27.5 bushels of grain and 1.3 tons of straw; Prussian Blue, which has been a favorite for years, yielded 27.2 bushels of grain and 1.5 tons of straw, while Striped Wisconsin gave 25.2 bushels of peas and 1.5 tons of straw. Regarding the dates of sowing peas to escape the bug, it was reported that peas sown April 30th produced 83 per cent. of infested peas; May 13th, 76 per cent.; May 25th, 67 per cent., and June 6th, 46 per cent. So far, late sowing seems a success; but the returns in crop have a lesson also. The yield from April 30th sowing was 17.9 bushels per acre; May 13th, 13.7; May 25th, 11.9, and June 6th, 6.2 bushels per acre. When this fact was pointed out a gentleman in the audience remarked that a little later sowing would get rid of both bugs and peas. The conclusions arrived at were that the peas should be sown early, so as to get a full crop, which should be threshed as soon as harvested, and treated with carbon bisulphide or ground at once for feed. If the latter is done, how-

ever, too great a quantity must not be kept together, as the chop in that condition is liable to heat and mould. In discussing varieties at this juncture of the meeting, Prof. Robertson made the observation that while the varieties that produced the heaviest yields over the Province may be taken in a general way as the safest to grow, it is not an infallible guide, and he strongly recommended farmers to test for themselves on their own farms several of the leading sorts recommended by the Union.

The experiments with roots were equally instructive with the cereals. Of carrots, Pearce's Improved Half-long yielded 26.6 tons per acre; Large White Belgian, 26.2; Guerande, 22.6, and Danver's Orange, 22 tons per acre. Pearce's Improved Half-long is preferred to the others, not only for the extra yield, but also for the ease with which they are harvested as compared to some of the others. The demand for mangel seed grows with the dairy-ing industry, since turnips are held in disfavor for the cows. In 1899 the demand was over three times that of any former year. The co-operative tests place Evan's Improved Mammoth Sawlog in the lead for yield with 31.8 tons per acre. Carter's Champion Yellow Intermediate gave 30.4 tons, but stands ahead of the foregoing in form and keeping quality. Carter's Warden Yellow Globe gave an average over Ontario of 27.6 tons, and Danver's Improved sugar beet, 27.3 tons per acre. By this it will be noticed that sugar beets, which have more feeding value than mangels, are creeping up in yield, so that a larger acreage of this crop may be expected in years to come. In turnips, Cow Horn leads in yield at 20.5 tons per acre; Jersey Navet, 18.6; Hartley's Bronze-top, 14.9, and Carter's Improved Hardy, 13.3 tons per acre.

The demand for potato seed is very heavy each spring, and for years, although many sorts have been tested, Empire State leads in favor, as it produces the highest yield, highest per cent. marketable, and is preferred to any of the others for table quality. It produced 204 bushels per acre over Ontario, 86 per cent. marketable. American Wonder yielded 188 bushels per acre, 84 per cent. marketable. Tonhocks, 172 bushels, and 72 per cent. marketable. Burpee's Extra Early gave 160 bushels, 74 per cent. of which were marketable. This variety stands next to Empire State in table quality. Regarding the advantage or disadvantage of cutting potatoes some time previous to planting, Mr. Zavitz reported that tests conducted on 218 farms over Ontario the past season show an average yield of 162 bushels per acre from seed planted as soon as cut, and 168 bushels from seed cut from four to six days previous to planting, showing that freshly-cut seed is most suitable to plant and is improved by an application of land plaster to the cut surfaces.

In growing corn for the silo it is highly important to get the sort most suitable to the district in which it is to be grown. The tests that have been conducted by the Union the past season show Mammoth Cuban and Mastodon Dent to be best adapted for southern Ontario; Wisconsin Earliest White Dent for central, and Salzer's North Dakota and King Philip for central and more northern districts. In point of yield, Mammoth Cuban gave 14.3 tons of crop, including 2.8 tons of ears; Mastodon, 13.5 tons of crop and 2.8 tons of ears; White Dent, 12 tons of crop and 2.8 tons of ears; Salzer's North Dakota, 11.2 tons of crop and 2.6 tons of ears; and King Philip, 10 tons of crop, including 2.7 tons of ears per acre. In a number of experiments to indicate whether growing corn in hills or drills give best results, it was found that in hills or squares three feet apart each way the whole crop produced was 11.5 tons per acre, with 2.7 tons of ears. The same quantity of seed per acre sown in drills three feet apart and given the same amount of cultivation produced 10.3 tons of crop, yielding 2.2 tons of ears per acre.

Small Fruit Culture.—Prof. Hutt reported the result of experiments with strawberries, raspberries, currants and gooseberries on 225 farms in different parts of Ontario. In these tests 4,800 strawberry plants, 600 each of raspberries, black raspberries and blackberries, and 300 plants each of currants and gooseberries were used.

In strawberries, the Clyde is found to be one of the most promising new sorts. It gave this year an average of 179.4 ounces of berries to each dozen plants; Woolverton came 2nd with 124.9 ounces; Haverland 3rd with 124.6, and Van Diemen 4th with 84.6 ounces of fruit per dozen plants the second year of growth. The Haverland, an early bloomer, gives an imperfect flower. The Van Diemen, which blooms about the same time, will fertilize the Haverland. The practice in commercial planting is to put the one required for fertilizing purposes in every fourth row. The Clyde and Woolverton are both perfect blooming varieties. The Clyde is a mid-season variety and holds out well. The Woolverton will stand the drought better than the Clyde. The Van Diemen rusts more than the others, but this tendency may be checked to a certain extent by spraying.

Raspberry experiments were unsatisfactory in 1899, owing to the severity of last winter, which destroyed many bushes. Shafter ranked 1st in five tests in plots planted in 1897, giving 51.4 ounces of fruit to the bush; Cuthbert, 37 ounces; Golden Queen, 38.6, and Marlboro, 34.6 ounces. Cuthbert is a bright, large, firm berry, and a better seller than Shafter, which is dark and soft, but quite suitable for home use.

In currants, Raby Castle yielded 39.6 ounces per