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already working out satisfactorily and the use of small threshers where they could be used to advantage.

He went briefly into the tractor work. The Ontario Government had 130 of these machines last year, and a tractor course is to be held shortly at the O. A. C. with probably 100 students. Dr. Creelman also referred to the campaign for vegetable production and stated that no poultry campaign would be put on this year. The labor problem was the one big problem in his opinion and he stated that he did not know how it was to be met unless 100,000 Chinese could be brought in in bond to do the work on the land and shipped out again after the war. This suggestion appeared to be more or less of a "feeler" and met a quick reply from one of his hearers: "Not on your life."

#### Experiments in Weed Eradication.

A summary of the co-operative experiments in weed eradication from 1912 to 1918 was given by Prof. J. E. Howitt. In 1912 six experiments were included as follows: The use of rape in the destruction of perennial sow thistle; a system of intensive cropping for the eradication of the same weed; the use of rape in the destruction of twitch grass; and a method of cultivation and cropping for the extermination of the same weed; a method of cultivation and cropping for the eradication of bladder campion; and spraying with iron sulphate to destroy mustard in cereal crops. In 1917 ten experiments in all were conducted including those already mentioned and a method of cultivation for the destruction of ox-eye daisy; a method of cultivation and cropping for the suppression of field bind-weed; a method of cultivation and cropping for the eradication of wild oats; and a method of cultivation for the destruction of chess.

In the past six years over sixty farmers have co-operated in this work. A complete outline of the experiments and results will be published in a future issue.

#### Canada Can Grow Her Own Root Seed.

One of the most important subjects discussed at the meeting was that of root seed production. Dr. M. O. Malte, of the Central Experimental Farm, Ottawa, expressed the opinion, based on experimental work, that there was no real reason why Canadian farmers should not produce considerable of their own root seed and that Canadian-grown seed was just as good as the European seed, if not better. In normal years Canada imported about 350,000 pounds of turnip seed, 900,000 pounds of mangel seed, and 30,000 pounds of carrot seed. Canadian farmers had labored under the false impression that European seed produced bigger and higher-quality crops. Before the war, there was no danger of root seed shortage. The seed companies always had two or three years' supply either in hand or on order, but now that the European countries have been forced to prohibit the exportation of seed Canada is facing a crisis. The supply for 1918 will likely be sufficient to go round but an effort must be put forward to grow our own supplies for 1919. The Dominion Experimental Farms expect to have 350 acres devoted to the growing of root seed this year. There is no reason why this country should rely upon Europe for root seed. Experiments in the United States and in Canada have proven that root seed can be grown successfully on this continent. Results of seven different tests of the Canadian seed of Yellow Leviathan mangel have shown an average yield of 3 tons and 750 pounds per acre more than produced from European seed, and with the Mammoth Long Red over 3 tons to the advantage of the Canadian-grown seed. Mangel seed can be grown in Eastern Ontario, Southern Ontario, British Columbia, and to a lesser degree in the Maritime Provinces and Northern Ontario. Turnip seed may be successfully produced in Eastern Canada, particularly in Nova Scotia, and carrot seed in Eastern Canada, and especially in British Columbia. If seed is not raised here this year for 1919 there is a probability that there will not be any seed to sow.

H. Stokes, of the Dominion Sugar Company, led in discussion. He believed with Dr. Malte, that Canada can grow better seed than can be imported, but the problem is to get the labor. From actual experience he had produced on a large scale from stocklings, mangel seed at a cost of from 9 to 32 cents a pound. He had also had fairly good results from small stocklings not bigger than a lead pencil, but of course a larger size is preferable. He advised that if pitting stocklings that the pit should not be more than five feet wide.

#### Northern-grown Seed Potatoes.

It was brought out in Dr. Zavitz' report that Northern-grown seed gave best results with potatoes. Justus Miller, Assistant Commissioner of Agriculture for the Province, led a discussion on Northern Ontario as a source of seed potatoes. That district is particularly free from what are known as the physiological diseases such as leaf-roll, mosaic and fusarium wilt. These diseases are carried in the seed and are more or less prevalent in Old Ontario. The short season in the North leaves immature seed; climatic conditions also have an effect and at the present time as a source of seed potatoes, Northern Ontario should be developed. The Department have secured 1,609 bags of potatoes from New Ontario and New Brunswick for experimental purposes, and they are endeavoring to increase the quality of the two varieties, Irish Cobbler and Green Mountain, in the North as a source of seed for older Ontario in the future.

Prof. Howitt, continuing the discussion, stated that New Ontario was practically free from these diseases, while in Old Ontario some fields were found with as high as sixty per cent. of leaf-roll, a disease which causes small potatoes, and where the little potatoes are again planted gains a foothold very rapidly.

Dr. Zavitz pointed out that the more immature the potatoes as a general thing the greater the yield from the seed.

#### Are You Working For \$392 Per Year?

One of the most interesting and valuable addresses of the entire meeting was that given by Prof. A. Leitch, who has had charge of the agricultural survey recently made in Caledon Township, Halton County. This survey was started on the first of October, statements were procured from 113 farms. After allowing 5 per cent. interest on the investment it was found that on one-third of the farms already tabulated the labor income of the farmer was \$392 for the year. This was on the small farms and the survey was made in a year when the farmers of Caledon Township made money if they ever did. In Prof. Leitch's opinion the farmers of these small farms in ordinary years have been working for nothing if they counted interest on their money. The following table will be of interest to readers. Only forty-nine of the farms have yet been tabulated.

Relation of Size of Farm to Labor Income.

Acres	Under 85	86-100	101-124	125-150	151-180	181-240
No. farms.....	16	12	5	7	5	4
Average size.....	72 acres	93	119	137	162	206
Average Capital.....	\$7,132	\$9,269	\$12,653	\$14,672	\$14,652	\$15,719
Productive Capital.....	\$4,317	\$6,185	\$8,422	\$9,254	\$10,129	\$10,991
Crop Acres per horse.....	16	22	22	24	25	25
Crop Acres per man.....	44	56	56	58	65	68
Labor Income.....	\$392	\$814	\$1,061	\$1,073	\$1,699	\$1,925

A study of this table reveals the fact that the larger the farm the greater the labor income. Readers will note that the unproductive capital is far higher in comparison to the size of the farm on the small farm than on the large one; that is to say, the man on the small farm finds it necessary to tie up, in comparison, much more money in unproductive capital than does the man on the large farm. Moreover, the expense of operation in both horse and man power is far higher on the small farm than on the larger one. It must be remembered, too, that these labor incomes were for perhaps the best year the farmers of the district ever had.

Another table shows the effect of good live stock and good crops on the same farms.

	Poor Crops and Poor Live Stock	Poor Crops, Good Stock.
No. of farms.....	13	12
Average size.....	102	111
Labor Income.....	\$366	\$1,150
	Good Crops, Poor Stock	Good Crops, Good Stock
No. of farms.....	12	12
Average size.....	126	116
Labor Income.....	\$866	\$1,304

It will be noted that the farms with poor crops and poor stock brought the lowest income; that those with poor crops and good stock, brought an income of practically \$800 more, which should be credited of course to the stock. Then those with good crops and poor stock brought a labor income of \$500 more than those which had the poor crops and poor stock, which means that good crops meant a difference of about \$500. And then, those which had good crops and good live stock as well brought nearly \$500 more than those with good crops and poor live stock; or, almost \$1,000 more than those with poor crops and poor live stock. Of course, there was a little difference in size of farms, which would make some difference in the returns. However, from the figures, Mr. Leitch concluded that the greatest need of this particular district was more good stock, particularly cattle, and an immediate increase in the quality of the live stock was necessary. There was a crying need for more capital on the farms.

#### Co-operative Wool Marketing.

Co-operation in wool marketing was dealt with by R. W. Wade, head of the Live Stock Branch, of the Department of Agriculture. Last spring application forms were sent out to 9,000 men to sell their wool co-operatively. In Mr. Wade's opinion there are from 8,000 to 12,000 sheep breeders in Ontario so that most of them would be reached by the forms. Up to April 23 about 100,000 pounds of wool was received. Advertisements were then placed in the farm papers and more than 100,000 pounds more wool obtained. All told, some 270,000 pounds were handled and this was the best wool in Ontario. Mr. Wade exhorted his hearers not to look altogether at the price but to co-operate as a principle. We must market in a big way and sheep breeders must believe in the principle, have confidence in those in charge of the work, and have courage enough to stand by co-operation in marketing. The Department of Agriculture did materially reduce the cost of selling, but the business must be put on a business basis, and while five cents a fleece was charged for handling it was not enough and in Mr. Wade's opinion one cent per pound would be about right with about one cent per pound added for freight. A few precautions are necessary for the producer of wool. Sheep must be so handled that the wool is kept clean, fleeces must be rolled tightly, sheep should be clipped when the wool is dry, and the wool should be stored in a dry place. Then, it is up to those in charge of the co-opera-

tive marketing to see to it that the buyers are satisfied; this means good and careful work in grading.

#### Sources of Seed Supply.

A topic of particular interest was that of sources of farm seed supplies for the Province of Ontario. This subject was taken up by a number of speakers, the first being Walter Steele of the Steele-Briggs Company. He pointed out that most of the seed grain was produced locally, that there was always a large demand for good seed oats and at the present time for Red Fife spring wheat as well. There seemed to be a sufficient supply of Marquis spring wheat, good barley and buckwheat available. Red clover is short, and it will be necessary to import from the Western States. There are ample stocks of alsike but the alfalfa seed supply is short. While timothy has been a good crop in Ontario and Alberta, Canada does not yet produce enough seed. This year it will be more than ever necessary to get supplies of seed corn from the United States. In Mr. Steele's opinion more farmers should specialize in pro-

ducing pure seed and should remove all weeds from growing crops of clover. He believed that growing vegetable and field root seeds was a specialized industry, and favored the importation, when practicable, of these seeds from Europe. The season of 1919 will be most critical.

Prof. W. J. Squirrell outlined the work the Union has done and the value it has been as a source of seed; 88,604 distinct tests have been made and the seed for these sent out after five years' trial at the O. A. C. The varieties distributed are of the very best, such as O. A. C. 21 barley, Mandseuri barley, O. A. C. No. 72, and O. A. C. No. 3 oats, Dawson's Golden Chaff and O. A. C. No. 104 winter wheat, etc. The Experimental Union has been the basis of the seed produced for the Canadian Seed Growers' Association, School Fairs, etc., and the prizes at the big fairs go to varieties sent out by the Union. These small quantities soon grow into large supplies. It is possible for one seed of oats to increase to 100 bushels in three years. The varieties are true to name, hand-picked. The Union is able to reach every farmer, and, better yet, the system is competitive. Those taking advantage of the opportunity to make experiments get the best seed of the best varieties.

R. S. Duncan, Superintendent of District Representative work, outlined the efforts of the Representatives in distributing seeds. In York County last year 150 individual farmers were, through the Representative, put in touch with other farmers having good seed. In Glengarry County over 2,000 bushels of seed were distributed in this manner. Besides, the School Fairs in charge of the District Representatives had been responsible for the children growing 3,072 plots of barley, 4,392 of oats, 1,380 of wheat and 14,532 of potatoes. The seed for which in one-pound lots of grain and five-pound lots of potatoes was supplied through the District Representatives.

The value of Field Crop Competitions in the distribution of good seed was discussed by J. Lockie Wilson, Superintendent. These competitions started in 1907 with a grant of \$1,000. Ten agricultural societies with 325 agriculturists competed; the acreage was 3,000. In 1917, 180 societies entered; 102 selected two crops and 85 one crop; 7,000 farmers in all took part and 70,000 acres were judged. One hundred and fifty field crop judges were trained by a week's Short Course at Guelph and the grant last year was \$25,000, \$13,000 in subvention from the Federal Department. Each society gets \$50 for each crop, the society putting up \$25 themselves for each crop. The seed is shown at the large fairs and meets a ready sale. Vegetable growers and market gardeners are now organized. The Government puts up two-thirds of the prize money and the Ontario Vegetable Growers the remainder. Mr. Wilson stated that the foundation of good farming lies in the thorough cultivation of the soil and took advantage of the occasion to refer to the value plowing matches and good plowing are in seed production, drawing attention to the Provincial Plowing Match in which there were 50 walking plows and 25 tractors which drew an attendance of 15,000 people in 1917.

Dr. Zavitz read a letter from L. H. Newman on the work of the Canadian Seed Growers' Association, and another from A. McKenney of the Western Ontario Seed Growers' Association.

P. L. Fancher, the Corn Expert and Secretary of the Corn Growers' Association, discussed the outlook for seed corn. Last year was a very bad season for corn and Ontario has not enough good seed of her own varieties to re-seed the seed-producing sections of the Province as was hoped. For silage, growers will have to be content with corn imported from the United States and will have to get seed from farther south than usual. Every effort is being made to get enough seed from which to grow corn for husking purposes. Mr. Fancher urged that all corn to be planted this year should be thoroughly tested by the farmer himself in order to safeguard the crop.