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ORCHARD EXPERIMENTS

Cultivation and Pruning Tests by Government Agents.

It Pays to Enrich the Soil — Late Cultivation Not Advisable—Pruning and Spraying Advocated—Thrifty Ewes Mean a Big Lamb Crop.

(Contributed by Ontario Department of Agriculture, Toronto.)

FIVE leased orchards in the Counties of Simcoe, Norfolk, Prince Edward, Lambton and Ontario, all being in apple growing sections, were looked after by the Ontario Department of Agriculture during the war. Four of these have been very profitable. In the Prince Edward county orchard it was successfully demonstrated that new heads could be put on old trees.

The Department found that leasing apple orchards is a profitable business, but several things must be done to make it so. On the lighter soils many of the trees are positively starving while on heavier lands this may not be so apparent. In the experiments very little commercial fertilizer was used, but the Department depended on the use of barnyard manure, mostly secured from Toronto. About seven tons per acre are sufficient for one application, which gives about 400 pounds per tree and the total cost is about \$21 per acre. The amount looks big but there is no doubt that it will pay well to spread that much on light land nearly every year.

About six or seven years ago we began ploughing, in the fall, several rows of trees in all the leased orchards (a portion being left in sod to test the sod mulch). This was done in order that we could answer from experience the frequent question—What about fall ploughing? When the land is fall ploughed cultivation can be begun much earlier in the spring. It costs much less to get land in good condition when it has been ploughed before winter, but we can see no advantage in ploughing closer than five feet from the tree. The troublesome part in orchard cultivation is close to the trunk and it is frequently difficult to work near the tree without injuring the bark.

We have tested cultivation against sod mulch, and have concluded that nearly all the orchards will be more profitable when cultivation is carried on, unless the land is first-class and there is plenty of barnyard manure for mulching. When to stop cultivation is rather hard to answer. It depends on the season. The drier the weather the later the cultivation should be carried on. On rich land apples will grow long after cultivation has ceased. We are stopping our cultivation earlier and earlier every year because our Ontario apples lack color; less cultivation means more color, more color higher priced fruit. Medium apples slightly colored seem preferable to larger ones lacking color. When cultivation is stopped a cover crop is frequently sown. The principal object is to rob the trees of nourishment in order that the fruit will color and the wood will ripen before winter. Some low growing crop from cheap seed gives most satisfaction.

Trees must be pruned to get high class apples. The best time to prune is early spring but we prune any month when the weather is not too cold for our men. If there are large cuts to make we leave a stub about one foot long and cut it off in the spring, as cuts of two inches or more do not heal well when made in the very cold weather; large cuts should be kept painted to keep the wood from decaying. Pruning is a slow business and it costs a lot to get a big orchard done, but it is absolutely necessary if good apples are expected. High trees are difficult to spray thoroughly. Twenty feet is high enough for any tree and several feet of top may be removed in a season with no bad effects. The tree with a low head is easier pruned, easier sprayed, can be picked for half the cost, and the wind will not blow down so many apples.—W. F. Kydd, Fruit Branch, Toronto.

Thrifty Ewes Mean Bigger Lamb Crop.

The best results from breeding are obtained from ewes that are in a gaining condition. If they are thin from having been kept on short fall pastures, they should have a little grain—from one-quarter to one-half a pound a day. This will put them in good condition and they will breed earlier and increase the lamb crop. Some fairly accurate record should be kept when the ewes are bred in order that when lambing time approaches the ewes may be separated from the main flock and given extra feed and care. If ticks, lice or scab appear in the flock, the sheep should be dipped even though the weather is a little severe. This is extra work, but the flock will be more healthy and thrifty. A warm place should be provided for the sheep until they dry off. The ram should also receive extra care at this time. In order to keep him active, vigorous and in fair flesh during the breeding season he should be fed a pound or two of grain every

day. "Extra care of the breeding ram at this time," says Mr. Anderson, "will insure a larger and stronger lamb crop and well repay the stockmaster for his extra labor."

Farm Notes.
From now on empty the hopper of the gasoline engine after using, and protect batteries from frost.

Do not forget that salt and water are as necessary for the cow as is feed. A table-spoonful of charcoal mixed with the feed aids digestion.

The dairy farmer not only studies how to feed his cow, but how to feed his land. He is not a soil robber, as he realizes that the farmer who reduces the fertility of his land robs without reason, since he steals from himself.

RURAL CO-OPERATION

Growth of the Principle in Our Own Province.

Live Stock Sales and Egg, Fruit and Wool Marketing — Much Done Through Farmers' Clubs — The Local Government Aids.

(Contributed by Ontario Department of Agriculture, Toronto.)

IN the field of Agricultural Co-operation in the Province of Ontario, the greatest advance during the year has been made in connection with the shipping of live stock. Five years ago there were practically no Live Stock Shipping Clubs. At the present time between three and four hundred separate organizations (including Farmers' Clubs) ship co-operatively. The majority of these ship to the Live Stock Branch of the United Farmers Co-operative Company, which handled about 30 per cent. of the stock going through the yards. Present indications point to the possibility, within the next few years of the larger proportion of the live stock of Ontario being shipped co-operatively.

The second important development in the province is that in connection with Egg Marketing. The year previous to this there were about fifty active Egg Circles in the province marketing eggs and poultry, to the value of about \$120,000. The number of Circles has increased until there are now some sixty in operation, and Farmers' Clubs as well as Egg Circles are now taking up this important work. The most noticeable development is in the grouping of Circles in various districts for the purpose of establishing candling and grading stations, and already some three districts are so organized, each consisting of a dozen or more local circles. The United Farmers Co-operative Company has recently opened a department for eggs and poultry and this fact will doubtless have the same effect as in connection with Live Stock Shipping.

A development in connection with Co-operative Marketing is the movement on foot during the year to combine under one central company the manufacturing and marketing of the cheese from local cheese factories. This company has opened an auction market in Montreal with a successful and increasing business.

The co-operative marketing of wool was continued last year through the Ontario Sheep Breeders' Association as previously. The Canadian Co-operative Wool Growers, Limited, marketed a total of about 4,000,000 pounds, and of this amount Ontario supplied 775,000 pounds. It is estimated that Ontario's total production is about 2,500,000 pounds annually. Thus, 31 per cent. of Ontario's wool was marketed co-operatively last year.

A large proportion of the co-operative work in the province is carried on through unincorporated local farmers' clubs, of which there are some twelve or thirteen hundred in the province. The great majority of these are affiliated with the United Farmers Co-operative Company, which acts as a wholesale house for these clubs. The amount of business transacted by some of the clubs is remarkable. There are, of course, a number which do only part of their trading through the central company; the wholesale business, however, as reported in the annual statement of the central company, amounted to \$8,500,000. This will no doubt show a substantial increase in the next statement, since the company has established a number of branch stores and additional separate departments at the head office.

With the increase of business and the consequent larger financial transactions an increasing number of clubs have become incorporated under the Co-operative Section of the Ontario Companies Act. During the year there have been eighty incorporations, either as Share or Non-share Co-operative Companies. Where the club has reached the stage when it feels that incorporation will be beneficial, usually its business is on a fairly substantial basis and gives promise of being permanently successful. One such organization, for instance, handling live stock, feeds, grains and other commodities and buying supplies, is doing a business which averages about \$1,000 a day. There are other organizations in the province which do not actually carry on business, but whose work is one phase of co-operative endeavor.

such organizations are,—Apple Producers' Associations, Grape Growers' Associations, Tobacco Growers' Association and others of like nature which endeavor to study market conditions and advise their members as to prices. In some cases the association confers directly with the trade as to the prices to be paid the growers. Recent developments would indicate that out of these organizations may grow commercial co-operative companies of producers, controlling the output of the members.

A great deal of preliminary work has been done by the Department during the year in connection with the production of pure seed, more particularly of potato seed in Northern Ontario. This work is leading to the organization of commercial seed centres.

The trend of Agricultural Co-operation in the province during the last year or so is more in the direction of Co-operative Marketing than previously. Farmers' Clubs are usually formed with the idea of combining the purchasing of supplies for its members, and this line of business is usually the first attempted by the clubs. The amount of Co-operative Marketing business during the last year has, however, exceeded the supply business in the province and justifies our opinion as to the relative importance to the farmer of the Co-operative Marketing of his production of the result of his supplies.—F. C. Hart, Co-operation and Markets Branch, Toronto.

ABOUT HAIRLESS PIGS

ORIGIN OF LITTERS PUZZLE MEN WHO GROW SOME.

Lack of Important Ingredients in Sow's Rations Held by Authorities to Be Responsible—Cure Is Impossible, But There Are Methods of Prevention If Care Is Exercised.

To the swine grower the phenomena of hairless litters is a mystery in so far as origin is concerned. He simply knows that sows normal in every way farrow litters that are quite abnormal in one, all, or a combination of the following:—completely or partially hairless, with undevelopment of the head and neck; very small, weak and undeveloped generally. Such pigs usually die, in from a few hours to a few days after birth. Not all pigs in the litter are so affected, some being quite normal. The sow remains normal.

While the scientist has arrived at what is possibly the direct constitutional cause, the preliminary causes are also more or less in mystery.

A breeder may one year lose 90 per cent. of his pigs and the next year with the same breeding stock, feeds, quarters, water and management, obtain a normal increase. In certain years and localities that trouble seems to be almost of an epidemic, only to disappear entirely. Is it due to seasonal influence? Is it transmissible? Is it due to some poisonous element in the sow's ration which leaves her unharmed but which arrests or renders abnormal the later development of the pigs in utero?

It cannot be stated definitely that the cause is seasonal. Certainly there is no consistency in such a claim. The possibility of contagion is also most difficult to assume. It would, further, seem illogical that any actual poison to the foetus would leave the sow quite unharmed. Apparently the difficulty lies in some deficiency of the sow's ration—which is essential to the normal growth of the little pig. Apparently, too, this malady or abnormality is similar to the thyroid affections of calves and lambs.

Gilts are more predisposed to give hairless litters than are adults, possibly due to certain deficiencies in the ration being entirely absorbed by the dam. Further, the trouble is in practically every case confined to the winter-carried litter and is very rarely seen in the summer or fall litter. Apparently certain deficiencies in the ration may be corrected by the sow in the summer from other sources, whereas she has no recourse during the winter unless supplied artificially.

Here is what is known at present:

1. That a ration for the pregnant sow highly proteid or nitrogenous, predisposes to hairless litters, but that in many cases the correction of the balance and constituents of the ration apparently corrects the trouble. While there are plenty of cases to the contrary in Eastern Canada, the trouble is usually scattered widely and in all likelihood due to malnutrition. Sows are frequently given insufficient exercise, too little vegetable matter, such as clover hay and roots, and little or no mineral matter, such as charcoal, ashes, earth, etc. They have depended largely on a more or less highly proteid ration—shorts, bran, elevator screenings, etc.

It has been proven conclusively that the activity of the thyroid gland has a marked effect on the development of the young, further that the activity of this gland depends quantitatively on its iodine content. Exhaustive investigation has shown that in the sow this iodine content was much lower during the normal or usual months of pregnancy, than at any other time during the

year. All of the above are suggestions may regard as fearful and wonderful. The fact remains that the introduction of iodine into the pregnant sow's ration may have the effect of causing a normal litter, where the contrary had been the case previously.

There is no way to treat the affected small pig. Prevention only is possible through the sow.

1. Feed a light grain ration, as required, but balance it with plenty of clover hay in racks, and with pulped mangels or cooked turnips. Make mineral feeding a feature, charcoal, soft coal, wood ashes, ground rock phosphate, earth, soda, etc. The use of tankage, fish meal, bone meal, etc., is also recommended placed where the sows may help themselves from self-feeders or in the meal ration, 2 to 5 per cent. In many cases as previously stated, particularly in Eastern Canada, such preventive practice for some reason, is effective. In Western Canada, however, where the phenomenon is regularly the cause of very serious losses, the trial of a direct addition of iodine in the form of potassium iodide would be recommended. The minimum doses required to give results is not definitely known; however, the administration of five grain doses of potassium iodide daily during the pregnant period has proven almost a certain preventive. In fact, the use of this drug two or three times weekly is recommended where it is used during the complete gestation period. In practice, the best plan would be to have a druggist make up a solution of known strength or dilution. By the use of a small measuring glass a sufficient quantity of the solution to contain five grains of potassium iodide could be added, and stirred into the slop or meal, depending upon the number of animals fed.—G. B. Rothwell, Dominion Animal Husbandman.

U. S. Onion Crop.

The American Agriculturist estimates the onion crop for 1920 in the United States at 14,600,000 bushels. This is nearly 2,000,000 bushels above the 1919 crop, but almost 5,000,000 less than for 1918. New York State leads with 2,900,000 bushels, Ohio coming next with 2,300,000.

Making Violins Talk.

Experiments made by two young Danish engineers promise to revolutionize wireless telegraphy and telephony. They have discovered a new force, resembling electro-magnetism, by means of which it will be possible to increase the capacity of a wireless station to receive or dispatch messages.

The two inventors picked up wireless messages from different European stations, and by a specially constructed apparatus were able to take them down at the rate of six hundred words a minute. Mechanical recording of wireless messages has been attempted already in France and Germany, but the highest rate has been one hundred and twenty words a minute.

The force by which this is made possible is developed by sending an electric current through certain substances—for instance, lithographic stone (a slaty limestone). During an experiment one of the inventors went to a house connected with the demonstration-room by wire and played on a violin. This was distinctly heard by the gathering in the demonstration-room. In fact the sound was magnified so much that listening became almost unbearable. The inventor then talked into his violin, and another violin in the demonstration-room repeated his words.

All the Winners!

The sportsman's Baedeker, Ruff's Racing Guide, was originated and compiled by a man who never made a bet.

That is one of the most striking facts in connection with a book which has penetrated into every section of English society, from the Court at Windsor to the courts at Whitechapel.

Ruff was a sporting journalist. He was intended for the law, but forsook musty legal tomes for race calendars, and in a few years established a reputation as the brightest and most reliable writer on matters connected with the turf.

He refused to bet; but he was always willing to guide and advise those who wished to risk their money. His knowledge was strictly impartial and invariably accurate. He looked on, saw most of the game, and finally decided to publish his Guide, which first appeared in 1842. Ruff died in 1856, but his Guide is still the British turf classic.

These Beetles Eat Lead.

A sensation was caused some while ago by the discovery of a beetle that likes eating lead. Considerable damage was being done to some lead-covered cables, and it was found that the damage was caused by a beetle which bored into the lead casing. Specimens of the beetle had been found in lead-foil packets of tea, and naturalists concluded that the insects were coming from India or China. It is more probable, however, that the lead attracted the beetles.

Children Cry FOR FLETCHER'S CASTORIA

OAT ME?

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ABLE station as fol- TEST 8.44 a.m. 12.47 p.m. 6.48 p.m. 9.11 p.m. 10.10 p.m. AST 7.38 a.m. 11.16 a.m. 2.28 p.m. 5.45 p.m. off passengers.

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