

much of it is applied, the liquid will run down the leaf, carrying with it the fungicide or poison, and this, accumulating at the tips of the leaves, often causes burning and injury to them. It is also very wasteful to apply the liquid in a coarse spray.

Potato-spraying attachments are now made for most good sprayers, and from four to six rows can be sprayed at one time. The latest devices have the nozzles arranged so that the vines may be sprayed from beneath, as well as above, which is important, as all parts of the plant above ground should be protected. With these attachments, one man and a horse can get over a large area in a day. This is not always the most economical way to do, as, for instance, if a nozzle or nozzles should become clogged, the machine may go on for some distance before this is noticed, and there will be a patch left unprotected where the potato beetles can work and the potato blight may get a strong foothold; or perhaps the cart will jolt. Thoroughness is very essential, both in spraying for the potato beetle and for blight. A wise plan, if a four or six attachment is used, is to have a man or boy on the back of the sprayer watching for any clogging of the nozzles. The method preferred by the writer, though a little slower than that mentioned, is to spray two rows at one time, a man or a boy driving, and one sitting at the back holding a hose and nozzle in each hand. By this method one can direct the spray better, and can immediately note and fix a nozzle if it should become clogged. In this way the work is more certain to be thoroughly done, and thoroughness, especially when disease or insects are very troublesome, is better than speed. The distance apart of the rows should be regulated at time of planting, so that the horse and wheels of the cart will come between the rows. Many homemade machines for spraying are used, but most of these are very wasteful of material, and the liquid is put on in so coarse a spray that it runs down the leaf and most of the poison is washed off or down to the tip. There is no doubt that much of the difficulty in killing Colorado Potato Beetle is due to the fact that the poison is not evenly and thoroughly distributed over the leaves. There is the same defect with the watering can, which is an article which has been used in spraying potatoes for many years. There is no doubt that the reason why the dry application of Paris green for the prevention of the Colorado Potato Beetle is preferred in many cases to liquid is that when applied dry the poison is more evenly distributed. Various shakers and blowers have been invented for applying poison dry.

The effectiveness of an application of an insecticide or fungicide will be in proportion to the thoroughness with which the mixture is applied. Every part of the leaf left unprotected may mean a foothold for insects or disease.

THINNING FRUIT.

It pays to go through the orchard and thin out overloaded trees, more especially young ones. To allow a fruit tree to bear excessively one year is almost certain to result in little or no yield from it the next. The second year after, having recovered its vigor, it will, in all probability, again bear to excess. Thus, the habit of alternate bearing, to which many varieties are predisposed, becomes established or confirmed in the young tree. One year it bears so heavily that the specimens are inferior. The next it bears scarcely anything. The most vexatious feature about it is that the "off year" is liable to be one of scarcity and high prices. Even if this were not the case, it would still pay to take precautions to prevent the alternate-bearing habit.

But there are also good and sufficient reasons for thinning a heavy setting on mature trees. It taxes a tree far more to produce seed than fruit flesh. Thus, the attempt to mature an excessive number of fruits wastes the vigor of the tree, without producing as much edible fruit as would be grown if the fruit were thinned, while the small size, defective form (due to insect and fungus attack), and generally inferior quality, render the fruit far less valuable, whether intended for domestic use or for market.

In thinning, cull first any imperfect specimens, particularly those which are diseased or affected by insects. After this, thin out any branches or clusters to about one-half what seems a proper set. By the time the fruit is matured, it will be found quite thick enough.

Thinning apple trees will destroy large numbers of the codling moth. When plums and cherries are thinned, large numbers of curculio are destroyed; and in the case of any fruit, thinning out thick clusters is one of the best means of insurance against rot.

It must be acknowledged that comparatively few fruit-growers practice thinning, but then, many are likewise indifferent about spraying, although there can be no question as to the profitability of this operation. Labor scarcity will be pleaded by some, but high wages are paid not by large crops of inferior fruit in place of a few, but

by regular crops of choice quality year after year. We are convinced that a careful trial of judicious thinning will convert almost any grower to the practice, and are pleased to see that no less an authority than E. D. Smith, of Winona, is a strong advocate of the practice.

VEGETABLE CROP PROSPECTS.

Although the season is backward, the crop correspondents of The Ontario Vegetable-growers' Association report that the growers expect a fair to good crop of all kinds of vegetables. The fine growing weather during the latter part of June brought the crops along rapidly. The acreage planted to potatoes is slightly larger than that of last year, but the growth is from two to three weeks later, and some varieties came up unevenly. Early-sown roots also came up unevenly.

Some patches of seed onions are about the same as last year, and a fair crop is expected. In some sections, however, worms and maggots are injuring seed onions. In the Ottawa district rhubarb and asparagus have been plentiful; around Toronto rhubarb has been comparatively scarce, thereby keeping up the price. New beets are coming in plentifully, at good prices. The acreage in tomatoes for canning is not as large as last year, owing to unfavorable weather conditions. Sweet corn will be late. Other vegetables are doing as well as the season would allow one to expect.

POULTRY.

FATTENING CHICKENS FOR EXPORT.

Address by Adam Armstrong, of Fergus, Ont., before the Ontario Provincial Winter Fair, Guelph, 1906.

We have been at this business of fattening for some six years. When I first started, I went to the planing mill and had them make 100 fattening coops, each coop capable of holding 20 birds. We could thus fatten 2,000 birds at a time. We did not have 2,000 birds to start with. I employed a man who was an expert at fattening chickens, and it was not long before we had our coops full, and they did well; but there was a number of birds that seemed to take indigestion, and some died. When the season was over, we balanced our books, and we were \$100 in the hole, and we had 100 fattening coops on our hands, which cost \$175, making a total deficit of \$275. And then I thought of the plan of letting the farmers have these fattening coops and do the fattening themselves. One man put 20 birds in a coop he got from us, and, when he took them out, they had paid for the coop and paid for the food, and he had 10 cents left over on that lot; he had the coop to the good, and was well satisfied. The next year I gave out eggs to any farmer who would bring me back the chicks. I sold the eggs at 25 cents a setting. In that way the farmers got well-bred birds and we got a higher standard of birds to fatten, and, by that means, we now have nearly all the birds in the district pure Plymouth Rocks. There may be other birds as good as the Plymouth Rock, but we have not found them yet. At the present time I have 150 of these coops out with farmers, who are feeding the birds and bringing them in to us, and I have placed an order with a sawmill man to make 100 more coops to distribute out among the farmers, and I am going to let them have them for nothing, on condition that I must have the birds they fatten in them. We are now paying 9 cents a pound for crate-fattened chickens alive. Last week we weighed 350, and to-day and yesterday we weighed in 350. That will show you the interest the farmers are taking in the work in our district.

Q. How many do you take in in a year?

A. In 1903, 1,467; in 1904, 1,973; in 1905, 2,994; and in 1906, 3,607. By these figures, you will see that it is gradually increasing, and this has been done by getting the farmers interested in the fattening of chickens and by showing them the benefit of fattening in this way. I also use a circular, which I distribute among farmers, as follows:

HOW TO FATTEN CHICKENS FOR THE EXPORT TRADE.

To fatten birds for the export trade, it is necessary to have proper coops to put them in. These should be two feet long, twenty inches high and twenty inches deep, the top, bottom and front made of slats. This size will hold four birds, but the cheapest plan is to build the coops ten feet long and divide them into five sections.

WHAT TO FEED.

Oats chopped fine, the coarse hulls sifted out, two parts; ground buckwheat, one part; mix with skim milk to a good soft batter, and feed three times a day. Or black barley and oats, two

parts oats to one part barley. Give clean drinking water twice a day, grit twice a week, and charcoal once a week. During the first week the birds are in the coops they should be fed sparingly—only about one-half of what they will eat. After that gradually increase the amount until you find out just how much they will eat up clean each time. Never leave any food in the troughs, as it will sour and cause trouble. Mix the feed always one feed ahead. Birds fed in this way will be ready for the export trade in from four or five weeks. Chickens make the best gain put in the coop weighing three to four pounds.

When Mr. Westervelt asked me to say a few words, I happened to have in my coops at home a batch of chickens I got from a farmer that were not crate-fattened. He brought them into town and asked me to buy them, and I asked him, "Are they crate-fattened?" and he said, "No, but they are just as good." I said, "I cannot give you more than 7 cents a pound, and I do not want them even at that price, but if you will take them home and feed them five weeks, I will give you 9 cents a pound." He would not do that, and I put them into crates and fed them, and in five weeks they made an average gain of 2.5 pounds, and they just about doubled their money in the five weeks. If I had kept track of the cost of the feed, I think I would have made at least from 13 to 15 cents per head for the five weeks' feeding. One young man told me this year that it just cost him 30 cents per bird for the five weeks, and they gained 2-3 pounds in the five weeks. I fed them three times a day for the first two weeks, and twice a day after that. You can feed them just as well at night as in the daytime, and you can put the feeding coops in the pigpen and feed them at the same time as the hogs.

Q. Do you think you should keep them in the coops five weeks?

A. I certainly do; we have tested them in three weeks, four weeks and five weeks, and we get the best birds in five weeks.

Q. Would it be advisable to coop up ducks?

A. I do not know anything about ducks at all.

Q. Do the farmers feed them five weeks?

A. Yes, you can injure the birds by keeping them too long. We occasionally get a bunch that has been kept seven weeks, and they are not as good.

Q. What is the difference between a crate-fed bird and a stall-fed bird?

A. There is a great difference; you can tell it at once. There are muscles in the stall-fed bird, and there is none in the crate-fattened bird.

Q. Do they eat their feathers?

A. Yes, I have found they do. This year I put a little more salt in the feed, and I did not have any trouble with feather-eating.

Q. Do your birds moult?

A. Yes, quite often.

Q. What kind of grit do you use?

A. I like the mica spar; any kind of gravel will suit.

Q. Did you ever try fattening old birds?

A. If you take an old bird and put it into a coop and fatten it, it will do better than an ordinary chicken running around; the muscles will be gone, and it will be almost as tender as a chicken.

A. P. A. TO CONVENE AT NIAGARA FALLS, N.Y.

The thirty-second annual convention of the American Poultry Association will be held at Niagara Falls, N. Y., August 13th, 14th and 15th, 1907. In connection with the convention there will be held a Poultry Institute, and the programme, as a whole, should be very interesting. Several Canadians are slated to take part. The meetings will be held in the convention hall of the Cataract Hotel. Headquarters will be the International and Cataract Hotels. Application has been made for reduced rates on the fare-and-a-third basis. An attractive twelve-page circular of announcement, containing the programme of the A. P. A. Convention and Poultry Institute, and reliable information regarding railway rates, hotel accommodation, etc., may be had on application to President Grant M. Curtis, Buffalo, N. Y.

BREEDING STOCK VS. MARKET POULTRY.

Healthy, vigorous breeding stock is produced by mating healthy birds not too closely akin, and then hatching and rearing the young stock under conditions as nearly natural as can be secured. Free range, plenty of insects, plenty of grit, a sufficiency of green food, and grain in hoppers from which they may help themselves—these are some of the conditions that make for success in poultry-breeding. The old idea of "forcing" on mash is out-of-date. That practice is all right for finishing market birds, as it helps to make tender flesh, but the fowls that produce the eggs from which these market birds are hatched should be allowed to use their gizzards. Give the fowl room and liberty galore, and they will grow strong, keep healthy, and shell out eggs generously.