

feeding them properly, keeping the house clean and free from lice. Break up every broody hen not required for hatching eggs by putting her in a coop having a wire slatted bottom. Raise it off the ground to allow for a free circulation of air under her. Coop her up and feed lightly for a few days. Dust the setting hens well with some reliable insect powder at setting time and a day or two before hatching. Feed and water well during the hatching period. As soon as you have all the eggs you need for hatching purposes, the roosters should be removed or killed off. Remember there is a good demand for a new-laid, non-fertile egg, and quite a few firms are now paying a premium for this class.

The poultry house should be thoroughly cleaned out during the summer and a liberal coat of whitewash applied. If buttermilk or sour milk is available use these to make the whitewash, as either of these will stick far better than water. Also add five per cent. of carbolic acid as a disinfectant. If an earth floor is used, a few inches of the top soil should be removed and clean sand or gravel put in. Air-slaked lime used liberally under the perches will go a long way to prevent disease. An occasional dose of Epsom salts will act as a good tonic. One pound dissolved in hot water and fed in a soft mash or in the drinking water will do for a hundred hens.

In my poultry work I am convinced more and more that the success or failure of poultry keeping on the farm, in the village or on the city lot depends almost entirely on the attention given to the little details in the work. The faithful performance of the many small tasks goes a long way towards ensuring success in the poultry work. A sick hen left unnoticed may spread disease through an entire flock in a short time. A setting hen, becoming infested with red mites, may mean the loss of 13 chicks. A rain storm may come up suddenly and drown out a few dozen chicks in an hour, where a little care previous to the storm would have saved them all. Neglect of any detail is always sure to be followed by some loss, be it large or small. Poultry keeping is not learned in a day, nor is it gotten out of books. Success comes alone through hard experience. Chicken men, or chicken women for that matter, are not made, they are born. If you know chicken nature and know what that chicken is going to do next, then you are a "chicken man." If you profit by experience and are able to make good on past mistakes—whatever those may have been—then you are on the right track. These are the foundations upon which you must build your farm poultry keeping if it is to be successful. If you have been successful in your way, try to improve on that and get still greater profits. If you have made your poultry pay, see if you cannot get them to pay a little better by following up the market demands. If you see there is a demand for a special line of poultry product, go ahead and supply it; don't wait for your neighbor to do it. If you have found some good line of production and cannot meet the demand, get your neighbor in on it, too—co-operate as much as possible. If you have a high-class article, let the consumers know that they are eating your products. If you see there is a demand for high-class poultry products, you get busy and supply it; don't let the middleman get in ahead of you and do it, for you can do it cheaper. If you see there is a demand for non-fertile, guaranteed, new-laid eggs, get busy! If you see that milk-fed, crate-fattened roasters bring a fancy price, get busy! In all other lines of production there is a distinct grading as to brand and quality. Why not in poultry products? It is up to you as a producer to show that not all eggs are alike and that there are different grades of table poultry. Do not be satisfied with anything but the best. Do not forget to let the consumer know he is eating your products and that there are more of the same kind where those came from. You are in business the same as any firm. They boost their goods and their wares. You go ahead and boost your goods. Live up to the claims you make. If you need help to boost your goods and cannot do it alone, get your neighbor in on it. Work together—co-operate.

These suggestions, thrown out more or less at random, are given as a result of a number of years of practical experience with poultry on a farm, a careful survey of conditions under which poultry is produced on the average farm, and a study of the problems connected with extensive poultry raising both on commercial poultry plants and at agricultural colleges. All of these factors at one time or another play their part in the profit or loss at which hens are kept on the farm.—M. C. Herner, in "The Farmer's Advocate and Home Journal," Winnipeg, Man.

It is time to remove the roosters from the flock and make an effort to ensure nothing but fresh eggs to the consumer. The demand for eggs would be greatly enhanced if the consuming public could feel sure that every egg purchased was fresh. Producing infertile eggs is a big step forward in this direction.

### Strain is Important.

Again we wish to place emphasis upon the fact that there is really more in strain than in breed of poultry for egg production. Frequently the question is asked: which breed are the best layers? And the answer must always be: there is no best breed, but there is a wide difference in strains. It is always well, after deciding on a breed, to find out something about the strain from which the birds about to be purchased came. If the ancestors were show birds, there is very little likelihood of the hens being great layers. If the sires and dams of the hens were heavy layers, and from heavy layers with records, then it is reasonable to expect that the pullets will be heavy layers. Forget about comparing the laying propensities of breeds, and pay more attention to the laying qualities of different strains. We have known Plymouth Rocks, which were almost perfect in conformation and feathering, which would lay from only 10 to 12 eggs per year. We have also seen birds of the same breed, not so beautiful, but far more useful, which have laid over 280 eggs in a year—the same breed but not the same strain. Also, it should be remembered, that according to the best work of the most prominent poultry investigators, the tendency toward egg production is transmitted through the male birds rather than through the pullets. For instance, pullets from heavy laying hens may not transmit heavy-laying qualities to their offspring, in fact, may not be heavy layers themselves unless from a male bird with laying blood behind him, whereas cockerels from a pronounced laying strain are far more likely to transmit laying qualities to their pullets. Hens will soon have records as important as those kept for each cow in a well-regulated dairy stable. It is the strain that is important.

### Use Garden Refuse for Green Feed.

It would surprise you to see, if you have never noticed, young chickens eat green stuff from the garden. We do not mean to turn the chicks loose among the vegetables, but, where chicks are raised in confinement as they often are, they will relish any green stuff such as lettuce, radishes (leaves and roots), beet leaves, pea stalks, cabbage leaves and such material from the garden. Lettuce very often grows rank and abundant in the farm garden and may well be fed to the chicks. A great deal of the other materials are daily found as refuse in cleaning vegetables for the table and may be profitably utilized in supplying green feed for the chickens. And it must always be remembered that green feed is necessary to the best growth of the youngsters.

## HORTICULTURE.

### Lime-sulphur not a Good Potato Spray.

According to a leaflet recently issued by the New York Agricultural Experiment Station, Geneva, N. Y., lime-sulphur has not been actually proven of value when used on potatoes.

For four years the Station has failed to secure proof that lime-sulphur will or will not prevent potato diseases. In three seasons practically no blight appeared on the test fields, and in the fourth year it appeared so late that many of the lime-sulphur sprayed plants were already dead from the effects of the spray mixture.

To know the effect of lime-sulphur on the disease is very desirable, and the experiments will be continued with that object in view; but we have learned already that this material is not to be recommended for use on potatoes because of its harmful effect on the plants themselves. In 1911, lime-sulphur dwarfed the potato plants and reduced the yield 40 bushels to the acre below that on check rows not sprayed; and in 1912 it dwarfed the plants so that they died very early and produced 111½ bushels less marketable potatoes to the acre than those on Bordeaux-sprayed rows.

In tests reported in the present bulletin no late blight appeared in either 1913 or 1914, but lime-sulphur aggravated the effect of tipburn, dwarfed the plants, shortened the period of growth and reduced the yield each season. In 1913 early frost killed the plants on much of the experimental area when the Bordeaux-sprayed rows were still growing luxuriantly, though many of the lime-sulphur sprayed plants had been dead from two to three weeks. This frost lessened the contrast between the treatments, but the lime-sulphur rows produced about 25 bushels less to the acre than the check rows, while those sprayed with Bordeaux gave almost 20 bushels more than the checks. In 1914, Bordeaux spraying increased the yield 104 bushels to the acre, and lime-sulphur spraying decreased it 16 bushels. Of six reports from other investigators, only one, based on a single small test, gives as great an increase from the lime-sulphur as from Bordeaux mixture, while five show unfavorable results from

the use of lime-sulphur similar to those in our tests. Lime-sulphur is not a good spraying mixture for potatoes.

### Fighting Frosts With Fire Pots.

While visiting the Experimental Farm, at Ottawa, last summer we noticed fire pots and a frost alarm which had been installed to protect truck crops. On September 28, 1914, a severe frost was experienced at the Farms and the apparatus was brought into service. W. T. Macoun, Dominion Horticulturist, in his Summary of Results in Horticulture during 1914, reports on the cost of operating the pots and the advantages that accrue to the gardener through their use.

The heaters used were the ordinary lard-pail type. They were placed 20 by 20 feet apart or at the rate of 100 per acre. Thermometers were placed both inside and outside the heated area, being used in each case, one on the ground and one 14 inches above. Readings were taken at intervals throughout the frost period and a careful record kept of the temperatures. Besides this method of testing a number of tomato plants from the greenhouse were placed outside some being within the heated area and others outside of it.

Until 1.30 a.m. the heated area had a minimum temperature of 32 degrees F. against a minimum temperature of 28 degrees F. for the outside area. During the coldest period of the night there was a difference of 7 degrees between the heated and unheated areas. Most significant of all, the tomato plants protected by the heaters survived the frost while those beyond the influence of the fires were killed to the ground.

The expense of the plant and the cost of operating are of course the influencing factors. In this case 100 heaters cost \$31.00 and \$30.00 was paid for a frost alarm. The operating expenses were as follows:—

Placing and filling 100 heaters .....	\$ 1.25
Tending heaters, 2 men, 5 hours, .....	2.00
Fuel .....	12.50
Gasoline, 2 quarts at 10 cents, .....	.20

Maximum cost of operating for 1 acre, 5 hours .....

The fuel used is known as "fuel oil." It will not light with a match so gasoline is poured on top and lighted. Before the gasoline burns away the heavy oil will ignite.

The question of economy must be decided by the value of the crop. It is evident that this method of combating frosts will be more practicable where the product will yield a handsome revenue per acre. Otherwise the expense is too much. However there are numerous instances where gardeners will forego a small expense over and above the ordinary cost of operations in order to procure crops of certain kinds considerably out of season. After the severe frosts during the latter part of May, 1915 Prof. Macoun sends us the following report:—

"We have used several hundred pots this year, trying them with different crops, and have found that the temperature can be kept above freezing when the ordinary spring frosts occur. In the case of crops which are within a foot of the ground, such as strawberries, we find there is the greatest difficulty as the cold air passes close to the ground, and as the heat rises so rapidly there is difficulty in raising the temperature close to the ground. In the case of tomatoes and grapes the protectors protected the plants quite well. It is hoped that by preventing the inrush of cold air along the ground by running a strip of cotton or some other material along one side of a plantation the temperature could be controlled better, and we hope to get some information in regard to this before long. From our experience here I should say that these fire pots should prove very useful, where spring frosts occur, to protect crops which are a foot or more above the ground."

The results of the frost which occurred during the latter part of May are now quite apparent. The foliage of strawberries in some districts was injured thus precluding the possibility of a normal crop. In other instances the bloom was destroyed and the prospects darkened. On a field recently seen, Warfields showed the most injury. Berries were numerous enough but the foliage was so weakened as to make it impossible to bring the crop to sufficient size and maturity. Dunlaps had been injured in the blossom and the crop curtailed. The complaints regarding damage to the strawberry crop have been quite general but with regard to grapes and other fruit some reports were exaggerated and did not express the real conditions.

It will not pay to allow the weeds to gain a foot-hold on the patch of young strawberry plants. It would be easy to overcome the lawful plant with the persistent weed and that is what will happen if the grower is not vigilant.