

this bulletin for summer and winter use, some of which contain bluestone for diseases.

On April 22nd, 1907, experiments were tried with four of these emulsions, thirty trees being sprayed with each emulsion. By May 13th it was found that from 90 to 100 per cent. of the scales were killed. An examination was made for young later on, but upon the majority of trees no trace of young was found. No injury from any of the applications was noticed. The formula which was found most effectual was: Soap solution (as described), 9 gallons; water, 1½ gallons; paraffine oil, 40 gallons; rosin oil, 6 gallons. Cost, 15.4 cents per gallon.

For spraying, one gallon of the above is added to nine gallons of water, making the cost of the spraying material 1½ cents per gallon.

Rosin oil is a product distilled from rosin, of which it forms about 85 per cent. It is thick and viscid at ordinary temperatures, much resembling molasses in consistency. For our purpose, it has an extraordinary value in its property of facilitating the making of emulsions with crude oil and paraffine oil. Emulsions of these materials, without rosin oil, are difficult to make.

Paraffine oil is a trade name for lubricating oil or machine oil. It is a petroleum product, consisting of the heavier fractions of the crude oil. It is not volatile at the ordinary temperature, and hence would remain indefinitely on the tree if not removed mechanically, as by rain.

Following are the conclusions drawn at the Delaware Station after using the above formula: "A miscible oil, made up according to the formula given above, proved an effective insecticide for the San Jose scale where the emulsion, as applied to the trees, contained on about 10 per cent oil.

"Of the various miscible oils prepared at this Station, it is believed that the one made according to the formula given above is the most effective insecticide for the San Jose scale that we have produced, and it is believed that the emulsion thus made will be found to be effective when considerably less than 10 per cent. oil is applied to the trees.

"All the emulsions or miscible oils thus far tested, when applied to trees in leaf, injured the foliage seriously when used at a strength that was necessary to kill the majority of the adult scales; but it is believed that it is often better, where the work can be done fairly early in the season, to spray trees badly infested with San Jose scale while they are in foliage than to leave them unsprayed. This is advised, of course, only in those cases where it has been found impossible to spray the trees during the dormant season."

Canadian fruit-growers, while adhering to the lime and sulphur until it is clearly proven that something better is discovered, should carefully note the experiments which are being carried on with the "Miscible Oils," and when any formulas so promising as that given above are suggested, they should give them a limited trial.

DIRECTIONS FOR TREATING THE SAN JOSE SCALE.

Following is a copy of the instructions sent out by the Pennsylvania Department of Agriculture to residents of the State on whose premises the State Inspectors find San Jose scale.

"If you wish to save your trees, it is advisable for you to treat them promptly with some material that will kill the scale, but not injure the trees. You should cover the trees entirely with this material from top to bottom. Small trees can successfully be treated by hand, using a paint brush, if the twigs all be reached to the very tips, and on all sides. To save time and be sure of getting the trees entirely covered, it is best to spray them.

"We therefore recommend spraying (or thorough painting by hand) with one of the following materials:

"1. Lime-sulphur wash, made by boiling quicklime or unslaked lime with finely-powdered or ground sulphur, using 5 pounds of quicklime and 4 pounds of sulphur, in enough water to boil it for an hour, stirring it occasionally, and, after boiling, add enough water to make the entire amount equal to 12 gallons. Strain this well through a cloth as fine as it can be made to pass through, or, better, through a fine wire netting that has at least 24 meshes to an inch. Give the infested trees and shrubs two coats of this material at any time while the leaves are off, but the best time is just before the buds burst in the spring.

"2. Whale-oil soap, two pounds, dissolved in one gallon of water, applied as a spray or wash.

"3. The Commercial Insecticides, generally known as Soluble Oils, applied, in general, at twice the strength that is recommended by agents and manufacturers, or use one part of the oil to 10 parts of water, instead of 20 parts, as most commercial formulas are stated.

"4. Common Kerosene Oil or Crude Petroleum, emulsified, and used not stronger than 30 per cent. for peach and plum trees, and not more than 50 per cent. for apple and pear.

"Avoid other material than these here mentioned, as there is danger of killing the trees or not killing the pests. H. A. SURFACE, Economic Zoologist."

[Note.—Of these four modes of treatment, the best and safest, according to our present information, is the first one named, i. e., the lime-sulphur mixture.—Editor.]

POULTRY.

POULTRY HOUSES.

The Single House, Without Scratch-shed Attachment—Description of a Pen and Inside Arrangement—How Ventilation Without Draft is Secured, and Moisture Absorbed—An Up-to-date and Popular Arrangement.

By A. G. Gilbert, Manager Poultry Dept., Exp. Farm, Ottawa.

I was standing in a pen of a long poultry building, the latter one of several, of a large plant in Northern Ontario, last winter. I remarked to the managing director, who accompanied me, "I see that you have not the scratch-shed addition."

"No," he replied, "why have it when it is not required? Depend upon it, we would have adopted it had we thought it necessary. We have forty thousand dollars invested in this plant, and we built according to most up-to-date plans."



Ventilation Curtains.

This illustration shows the cotton frames above and below the windows, at the plant of the Poultry Yards of Canada, Pembroke, Ont.



Interior View of Poultry House, Poultry Yards of Canada, Pembroke, Ont.

The above halftone shows the roosts, dropping-board, with nests underneath. The hinged, curtain front is held partly open. The lathed enclosure for two cockerels is shown to the left. All these furnishings are at north end of the pen.

So spoke a practical, level-headed business man. It was his view of the poultry-house situation, and it illustrated the passing of the scratch-shed. Not the scratch-shed principle, be it noted, for the principle, so far as affording floor-room for the birds, was embraced in the pen in which I stood, and which really represented a single house, although one of many continuous pens. Of the single house, we write farther on. Meanwhile, we speak of the scratch-shed as a passing factor, for in recent years it has been largely superseded by the single house, which, by the way, is now generally recommended to farmers. It certainly stands to reason that, if the single house possesses the advantages of the double one, at less cost of material and space (money), it will best suit this highly practical age. We have no prejudice against the scratch-shed addition. Doubtless,

its plan of arrangement will be preferred in many instances yet to come.

THE SINGLE HOUSE—HOW IT IS FURNISHED AND HOW IT LOOKS.

Not every house that was built in past years had the scratch-shed attachment. A notable instance was the poultry plant of L. H. Baldwin, Deer Park, Toronto, which is still to the fore. And, again, there was the plant of the Toronto Poultry Co., at Eglinton, a suburb of Toronto. Of both these plants and their genial managers, the writer has many very pleasant recollections. A correct idea of an up-to-date poultry plant, on the single-house, continuous plan, may be had by a visit to the Poultry Yards of Canada, at Pembroke, Ont. The following is a description of the interior of one of the single houses of this establishment:

The pens are 10 x 16 feet. Entrance to them is had from a 4-foot passage. Both passageway and pens run the length of the whole building. The floor of the pen we are describing is concrete, and on this is litter to the depth of eight inches, affording all the material for the birds to search for the whole grain thrown into it that is requisite. There is also a hopper, divided into four compartments, containing grit, oyster-shell and charcoal.

Drink water is supplied in tins so arranged that the birds cannot wet their combs or feathers while drinking. This is a point of no little import in cold districts. Meat, vegetables, etc., are regularly supplied. The rations are principally whole grains, with mash occasionally.

The ceiling of the pen is slatted, and above it is straw, which absorbs any moisture.

The window, which is four feet square, is to the south. This is shown in plan below.

At the north end of the pen are the roosts, dropping board, and nests underneath them. In front of the roosts there is a hinged curtain, which may be swung shut on cold nights, thus protecting the fowls.

Ventilation, one of the most important features, is secured by openings 1 x 4 feet above and below the window. These openings are covered with cotton, and through these cotton-covered frames, or openings, the air passes, without draft. The object is to secure diffusion of air without draft at all periods of the winter season. This, in conjunction with the straw above the slatted ceiling, has been found an admirable system of ventilation. The theory is that moisture is absorbed by the straw, while fresh air is supplied through the cotton above and below the windows. In the past three winters—the age of the poultry-yards—there has been no moisture in any of the pens, which are all arranged according to the foregoing pattern, nor has there been faulty air.

It may be said that, to the left of the roosts in each pen there is a small lathed enclosure, about three feet high, and which holds two male birds. During the breeding season, one of these birds is allowed out one day, and the other the next—an excellent arrangement.

OTHER STYLES OF HOUSES.

There are several other styles of houses and arrangements of interior, but the above is not only a popular pattern of house, but one that has been found most satisfactory at one of the most northern points in Canada. A pattern of a house of similar arrangements, but with cotton on each side of the windows, instead of at top and bottom, was described in "The Farmer's Advocate" last spring in the article about the poultry plant in connection with the Free Hospital for Consumptives at Gravenhurst, Ont.

The value of the total farm productions of the United States in 1907 is \$7,412,000,000, an amount 10 per cent. greater than the total for 1906, and far exceeding any previous year.