

until dissolved. The wash was then strained and applied hot.

LIME-SULPHUR WASH.

(Formula III.)

Lime	15 pounds.
Sulphur	15 pounds.
Water	50 gallons.

This mixture was made in the same manner as the boiled lime-sulphur-salt wash, except that the salt was omitted.

SELF-BOILED LIME-SULPHUR-CAUSTIC-SODA WASH.

(Formula IV.)

Lime	30 pounds.
Sulphur	15 pounds.
Caustic soda	6 pounds.
Water	50 gallons.

In preparing this wash the lime was started to slake with six gallons of water; and, as soon as the slaking commenced, the sulphur, which had just previously been made into a thin paste with hot water, was added and thoroughly mixed in with the slaking lime. To prolong the boiling of the wash, the caustic soda was then used, with water as needed, and the whole mixture was kept thoroughly stirred. As soon as the chemical action had ceased the required amount of water was added, when the mixture was ready for use. The soda used in the preparation of this wash is a powdered 74 per cent. caustic soda. It sells for 4c. a pound, and is contained in 50 lb. cans.

BOILED LIME-SULPHUR-CAUSTIC-SODA WASH.

(Formula V.)

Lime	30 pounds.
Sulphur	15 pounds.
Caustic soda	6 pounds.
Water	50 gallons.

This was prepared in the same manner as the self-boiled lime-sulphur-caustic-soda wash, after which the mixture was boiled for one to two hours over a fire.

In each experiment with each variety of fruit the number of trees was divided as evenly as possible for treatment by the different sprays. Comparative tests were made of the above described washes in all of the orchards, with the exception that the self-boiled lime-sulphur-salt wash was omitted in two orchards, and the self-boiled lime-sulphur-caustic-soda wash in one.

SCALES KILLED.

All the trees were examined carefully early in May and several times during the summer, to determine the effect of the treatment. All the washes proved equally destructive to the scales, and as effective as spring treatments upon similar trees. This was true not only of San Jose scale, but also of the scurfy bark louse, which infested many of the trees in one orchard. On all trees with smooth bark practically all the insects were killed, whether few and scattered or so plentiful that portions of the trees were encrusted with a layer of the scales so closely crowded that the bark could not be seen. On trees with naturally rough bark, or bark roughened through age, some insects would escape and occasional ones might appear upon the new growth and upon fruits. In general, wherever any one of the washes was brought into contact with the scales the insects were killed. On smooth trees, any considerable number of scales left unharmed is evidence of lack of thoroughness in spraying; but no heavy wash or spray mixture need be expected to reach the scales that are clustered beneath close-clinging pieces of rough bark or hidden in deep cracks and crevices.

EFFECT ON TREES.

The winter of 1903-4, following these treatments, was the coldest for years; and untreated trees in many localities, especially trees weakened by disease or by insect attack, suffered severely. This fact makes it somewhat difficult to interpret fairly the variable results of these spraying tests; but comparison could be made with a large number of check trees in three orchards of different general condition as to varieties, vigor of growth, and amount of scale infestation.

In the most vigorous, scale-free orchard at Geneva, the coating of lime and sulphur considerably reduced both bloom and foliage upon Fitzgerald peaches and Reine Claude plums; but after the blossoms dropped the sprayed trees showed marked improvement, and by the end of the season equalled the checks in appearance, but bore a smaller crop of fruit. It seemed as though all the trees were lessened in vitality by the severe winter, and that the sprayed ones were also affected by the spraying; but that the check to fruit production caused by the spraying allowed the sprayed trees to recuperate faster. Had the unsprayed trees been well infested with scale, the advantage at the close of the season would probably have been with the treated trees, notwithstanding the injury due to the spray mixture.

In the other Geneva orchard bloom was somewhat less profuse on the sprayed trees, but the injury was less than in the first orchard. Sprayed Morello cherries, apples and pears showed slight diminution of bloom; but crab apples suffered no injury. Trees in this orchard that were much infested with scale were killed or severely injured by the winter.

In the Long Island orchard the sprayed trees, except those reduced in vigor by the scale or injured by the winter, were unaffected by the spraying. The sprayed apples showed, later in the season, increased vigor and healthfulness as a result of control of the scale.

ADVICE.

As a whole the work shows that sulphur washes applied in the fall may under certain conditions cause injuries such as sometimes attend the excessive use of these sprays in the spring. But it is believed to be advisable, when experience has shown that it is impossible to spray all of the trees in the spring, to employ fall spraying for the treatment for the hardier varieties of fruits; as the increased vigor and usefulness of the trees arising from the control of the scale will more than compensate for probable losses in fruit yields.

All of the washes tested proved equally effective in the destruction of the scale. The addition of caustic soda or salt to a lime-sulphur wash cooked by fire or steam did not add to its effectiveness. While satisfactory in the present experiment, later tests with the lime-sulphur-salt wash prepared without external heat showed that there may be considerable variation in the different preparations which may be largely avoided by using high-grade lime and knack in the cooking operations. The washes that are well suited to the needs of average orchardists are the lime-sulphur wash, boiled by fire or steam, and the lime-sulphur-caustic-soda wash, prepared without external heat. In conducting the experiments this spring the following method was adopted for the preparation of the lime-sulphur-caustic-soda wash, as it is an easier way of making the mixture. First, the sulphur was made into a thin paste with hot water, and was then poured over and well distributed throughout the lime. Additional water was used as needed to keep the lime-sulphur material in a rather stiff paste. As soon as the lime was slaked the full amount of caustic soda was added and stirred until the boiling action had ceased. Enough water was then poured in to make the required amount of wash. By using boiling water in making a paste of the sulphur and slaking the lime much less time is needed to prepare the wash.

POULTRY.

This is the week of the great Ontario show.

At least once a week give the floor and perches a good cleaning, remove all droppings and scatter a little dry earth or sand about the floor.

Overfeeding is expensive. It not only costs more for the feed, but the hens get too fat and lay no eggs.

The cockerels which do not go to market in the next thirty days will eat their heads off before prices are higher.

If your hens lay soft-shelled eggs it is because there is not enough lime in their food. Feed them grit—gravel, oyster-shell, plaster or ground bone. Cut clover is another source of lime in the poultry ration.

Now is the proper time to buy extra birds. It is a mistake to put off buying until next spring. Prices will have doubled by that time.

The farmer's flock is usually of all sizes, shapes and colors that fowls ever grow to. They are often abused, neglected, half starved and left to shift for themselves generally; but for all that, they generally pay their way and often return a fair profit.

Poultry Profitable.

The high prices now being obtained on the market for poultry and eggs should serve to stimulate the production of more of these products. The demand for eggs is constantly increasing for home consumption in our growing cities and towns, where the call for hen fruit has grown so fast, and the prices rule so satisfactory that the export trade in this commodity has actually fallen off, the prices obtained at home being greater than can be realized by shipping the product abroad, which is surely an indication of prosperity at home, and the ability of the people to afford a luxury which is at once palatable and wholesome. Physicians are more and more prescribing eggs and milk for building up the health and strength of their patients, and this is another factor in increasing the demand.

Poultry-raising is a branch of farming so simple and easily managed that the wonder is that increased attention is not given by the average farmer to producing more and better stock of this kind, so as to reap a larger share of the profit that is available from this source. Expensive quarters are not necessary for this purpose. Any man a bit handy with tools can fit up a comfortable place for fowl, a plain frame of scantling, common boards and paper for siding being all required, and their feeding requires no special skill, though they will pay well for extra attention and intelligent handling.

The general-purpose or utility breeds, such as Rocks and Wyandottes, will be found most suitable for the general farmer, and the aim should be to raise or secure early-hatched pullets and

yearling hens, which are the most fruitful layers.

The principal requirements in their housing and treatment are dry quarters, free from cold drafts, with a southern exposure and plenty of light and sunshine; access to gravel or grit; their grain scattered in chaff or straw, to encourage scratching for exercise; a variety of food, including some meat and vegetables, and crushed green bone; liberty on fine days to run out for a few hours, and attention to keeping them free from lice and mites, which are their worst enemies.

NEWS OF THE DAY.

Canadian.

The rule dispensing with mixed choirs in Roman Catholic churches has been adopted.

Archdeacon Williams, of Stratford, has been elected Bishop of Huron.

The new ice-breaker Montcalm, which was built in Scotland for the Dominion Government, and is to be used on the St. Lawrence River, arrived at North Sydney November 29th.

Speyer & Co., New York, closed negotiations for \$16,000,000 of the four per cent. first mortgage bonds of the Grand Trunk Pacific.

Mr. John Cowie, the Scottish expert on the curing of herring, who was sent by the Minister of Marine to investigate the herring fisheries on the Pacific coast, reports that in his opinion one of the largest herring industries in the world can be developed along the coast of B. C.

A new process for refining and smelting nickel and copper ores is to be tried at the "Soo." If successful it is expected that it will revolutionize the nickel and copper industries of the country.

Mr. John Bertram, President of the Bertram Engine Works, died Nov. 28th. He was long known as one of the leading lumbermen of the Dominion, and held the positions at different times of President of the Collins' Bay Lumber Co., Chairman of the Dominion Commission on Transportation, and Member of the Ontario Forestry Commission. He was member of the Dominion Parliament during 1872-1878.

Rev. Principal Caven, of Knox College, Toronto, is dead.

Ten U. S. fishing vessels were seized by the Canadian fisheries cruiser Curlew, for illegal fishing in Pasmaguddy Bay, N.B. The Curlew is a 150-ton steamer, carrying 25 men and mounting one Gatling gun.

During the first week in January a conference between representatives of the Territorial and Dominion Governments will be held in Ottawa, to consider the question of granting Provincial autonomy to the Territories. Since the granting of autonomy is a certainty, the main question at issue will probably be whether one province or two shall be formed, and the terms upon which such an arrangement may be accomplished.

British and Foreign.

There is much distress in some of the Western countries of Ireland, owing to a complete failure of the potato crop, and many of the people are emigrating; 2,000 arrived in New York during the past week. Steps will be taken to give the impoverished farmers employment on local improvement schemes, and to induce landlords to grant reasonable rents.

A St. Petersburg despatch to the Herald says that the Shah of Persia has developed much anxiety over the designs of Great Britain sending constantly so-called commercial expeditions to his country. In view of this he is about to send an important diplomatic mission to St. Petersburg, headed by Mirza Riza Khan, the Shah's Ambassador at Constantinople. This action, in view of Lord Curzon's departure to India, is considered in diplomatic circles at St. Petersburg as a political event of the highest importance.

The Japanese still continue to gain signal advantages at Port Arthur. On November 29th, after a terrific struggle of two days' duration, they gained possession of 203-metre Hill, which was at first reported to dominate the whole harbor and town; later despatches state, however, that it only commands a portion of the other defences. Nevertheless, the position is looked upon as very important, and long-range guns are being mounted upon it with all possible expedition. In Japan much indignation is being expressed at the manner in which European nations—and especially the French—have assisted in the eastward progress of the Baltic fleet. It is feared that, owing to the present attitude of France, the Russian ships will find convenient bases at Saigon and at Kwangchan, near Hong Kong. It is expected, however, that the fall of Port Arthur will now be but a matter of a few days, and hence will be accomplished long before the attention of the Japanese must be distracted by the arrival of Rojestvensky's war dogs.