

maintenance was 27 cents per barrel on the sod mulch, and 24 cents on the tilled-and-cover-crops area. The trend of the yields from 1904 to 1908 was downwards on the sod mulch, and upwards on the tilled areas.

Somewhat similar results were obtained from the orchard-survey work in three counties in Western New York, where it was found that orchards tilled for ten years or more gave 45 per cent. larger yields than those in sod ten years or more, but otherwise well cared for, while those tilled five years or more gave 15 per cent. larger yields than those in sod five years or more. Of those orchards in sod and pasture, best results were shown by those pastured with hogs, second best by those pastured with sheep, while those pastured with cattle gave poorest results of all, poorer, even, than where the grass was removed by cutting. One reason the orchards where hogs were kept made such good showing was that these were partly cultivated by the swine, which also reduced the loss from codling moth by destroying the worms in many fallen apples. From the results of the orchard-survey work, the authorities concluded that, while some few orchards, exceptionally situated, as, for instance, on hill-sides or rough ground, might give more profit from pasturing or mulching than from cultivation, still taking into consideration the expense of tillage, the extra cost of barrels, labor in handling, and so forth, four-fifths of the orchards now in sod in those counties surveyed would give greater net returns if tilled.

Our Spraying Operations.

The first spraying in "The Farmer's Advocate" demonstration orchard this year was commenced on Friday, April 8th. It should have been started a little earlier, but the unwonted forwardness of the season, owing to mild weather in March and early April, has rather upset calculations all round. The aim is to put on this first spray of lime-sulphur just as the leaf buds are about to burst. On the Greenings and early apples we found the buds had opened and were showing some leaf-surface, in some cases half an inch or more, so instead of applying the lime-sulphur spray at the spring strength of 1 to 9, as recommended by Mr. Caesar, we put it on about 1 to 11 for the first two barrels, and afterwards 1 to 15. Little injury was to be seen, on examination, at the end of last week. A slight scorching or browning was observable on a few of the outer leaves. Experts say the leaves are more hardy just after opening than a few weeks later on. It is probable that it would have been advisable to use the lime-sulphur of a strength of 1 to 12 on the whole orchard, as this would have more effect on the oyster-shell scale than the weaker wash. However, it was thought well to be on the safe side. We shall be pleased to hear from readers who have used lime-sulphur in various degrees of strength after the buds have burst.

The second spray recommended by Mr. Caesar is lime-sulphur, summer strength (1 to 30 or 35), or Bordeaux mixture, either being applied with a poison. This is supposed to be put on just as the blossom buds are about to open. We propose to omit this second spray on part of the orchard. The most important spray of all is the one just as the blossoms fall, this being for the especial benefit (?) of the codling moth, though also for scab. The idea, then, is to use poisoned Bordeaux or poisoned lime-sulphur in rather weak strength, drenching the trees thoroughly, and getting some of the spray into the blossom-end of every small apple. For this spray we propose to use chiefly lime-sulphur, about 1 part concentrated solution to 35 parts water, adding to this arsenate of lead, two pounds to the barrel of mixture.

POULTRY.

Sulphur for Egg-eating Hens.

Editor "The Farmer's Advocate":

As a subscriber to "The Farmer's Advocate," and one who reads it pretty well, deriving a good deal of benefit from its pages, my attention was drawn to an article on "Egg-eating Hens," on page 617 of the April 7th issue, and would like to submit my experience on the same subject. In a pen of 18 hens, eggs kept disappearing each day, until finally I got no eggs at all—nothing but a wet nest, with every sign of a good feast. I fed a handful of flour of sulphur to a two-quart measure of chopped oats and barley, wet with skim milk or buttermilk, just so as to make it thick; and the result, from 12 to 17 eggs a day, with a clean nest. I fed the sulphur for four or five days, then stopped a while, and repeated at intervals. I find this is better than cutting their heads off, so please pass it on. J. H. G.

Essex Co., Ont.

Poultry Housing.

Editor "The Farmer's Advocate":

When anyone is getting a good egg yield in winter, the first question he is often asked is, "What are you feeding?" or "What breed do you keep?" Personally, I think feed and breed should take second place, and the question be asked, instead, "How do you house your birds?" I think, myself, that the housing question is of the most vital importance. Last spring I rented a house about two miles from the city. There was an old shed, very tall, with a decided leaning to the south, a most unsightly structure, and I asked permission to pull it down and build up a henhouse of my own design. In reality, it was a design from one of the bulletins I got from the O. A. C., Guelph. During the building of the house, some of my neighbors asked, "How do you propose to heat it?" and I said, "I don't propose to heat it at all." And some of my wise friends shook their heads, and prophesied disaster for the greenhorn (me). However, I built my house 14 x 18, 7 feet high in front, and 6 feet at back; one window in front south side, and one in the south-west corner. By this arrangement, I get the sun from the first streak in the morning to the last declining ray in the evening. My front window had eight lights, but I knocked two of the top ones out, and nailed a piece of cheese-cloth in the opening, thus giving good ventilation, especially as, being a bad carpenter, I failed to bring the roof down tight to the back boards, and in places there was a space of from 1 to 1½ inches; but, rather than being a fault, it was only improving the ventilation. I rigged the perches on the east end, with drop-boards and nest boxes beneath them. I got my girls to carry garden soil into the house, and all together, the floor was covered to a depth of about four inches, to which I added another four inches of straw. I must here state that the floor of the house is raised 2½ feet from the ground, open on the south side, and boarded on the other three sides. I had a trap let into the floor of the house, so that on mild days my birds could get right down to Mother Earth and scratch to their hearts' content. Needless to say, by this arrangement, my birds, besides having a comfortable house, also have a fine scratching-shed, and shade during the hottest part of the day in summer.

Now, the question is, has my house, without the aid of artificial heat, been a success? I must say, most decidedly so. I put 22 birds in this house last fall; 11 were hatched on the 17th of April, 1909, and 11 on the 29th of May, and up to March 7th I had 715 eggs. I have not had a single sick or mopey bird in the whole bunch. I have an incubator running at the time of writing, with 124 of my own eggs, 108 of which are fertile by test. I invited one of my friends (who didn't like to believe I was getting eggs from hens in a cold house) to pay a visit to my henhouse, and see for himself how my birds fared, and didn't he get a surprise. He came on one of the coldest nights we have had this winter; it wasn't below zero, but it was a real dirty, damp, cold, east wind. As soon as I opened the henhouse door he said, "Why, you have your place heated, after all; I thought you would." But it was amusing to watch his face when I told him it was not heated artificially, but only from the animal heat from the birds themselves. To say he was surprised is only a mild way of putting it, and I think he went home, if a sadder, a decidedly wiser man.

Now, what have my neighbors been doing in their warm houses? First, how are they warmed? In the majority of cases, the hen-roost is a part partitioned off from the cow-stable. Go into such a place at night, take a hen off the roost, and you will find her damp with perspiration. Is that healthy? In a great number of cases the stable is badly ventilated, and cows and hens breathe the same air over and over again. Is that healthful? In a great many cases the henhouse is cleaned out once or twice a year, and the floor is nearly always damp, and an offensive smell rises from the droppings and urine of the cows mingling together. Is that healthful? I think not.

Would you like to live under such conditions yourself? I think not. I am sure none of us would like to be cooped up for five or six months, or even days, under such conditions. If we want to fight the great white plague, we must have fresh air, clean surroundings and wholesome food; and where do we find the ravages of consumption worse than among fowls, and is it a wonder, when we consider the conditions under which they are kept?

Remember, you have the chance of a breath of fresh air whenever you like to open the door. Not so Biddy; an open door to her under such conditions means a chill, with its consequent evils. Remember, also, that fresh air, good food and comfortable surroundings will fill the long-felt winter want—a full egg-basket.

Carleton Co., Ont.

MARTIN TREWHITT.

[Note.—Pressure of space has occasioned delay in the publication of this article, which accounts for the egg record not being brought down to date.—Editor.]

APIARY.

Elementary Instructions in Bee-keeping.—IV.

ADVICE ON EQUIPMENT.

Before purchasing any bees, it is better to read a good book on the subject. Don't choose one that is out-of-date; to make a success with bees, up-to-date methods must be practiced. Some books are not intended as instructive for beginners. There really are but few books written expressly for the incipient beekeeper. The "A B C. X Y Z of Bee Culture" is one of the best books for beginners that I have read. "Langstroth on the Hive and Honeybee," Dadant revised edition, also is good. The publishers of this paper will be pleased to send any bee-book at regular price, plus postage. After you have gotten your book, study it thoroughly. Don't read it like a story-book; it must be read and reread with real enthusiasm and interest in the subject.

It also is a good idea to send to manufacturers and dealers of bee supplies for their catalogues. I did that, and got much valuable information from this source. Let me warn the beginner not to purchase a patented, newfangled hive or other device that is not approved of in a reliable text-book. I made some mistakes here, and to my loss, of course. And I nearly made a greater mistake yet by adopting a much-lauded hive (praised by the inventor in his advertising circulars). The advantages supposed, or at least, asserted, were made so convincing that I thought I would not have much surplus honey unless using this particular hive. The fact is, good crops of honey can be secured with this kind of hive, but this is equally true of any other good hive. Another thing, if a patented hive is adopted, the user can purchase from one manufacturer only, and that generally at an advanced price.

The hive most used, and as good as any under average conditions, is the dove-tailed, of Langstroth dimensions. Use the eight-frame size; the ten-frame hive is much used, too—in fact, I use it myself—but, for northern latitudes, and for comb-honey production, the eight-frame hive is about right. I recommend it for beginners.

For the supers, the top parts of hives, wherein the sections are put, use the kind that take the standard 4½ x 4½ sections. You see, there is an advantage in using standard goods. They can be purchased of every dealer, and at a less price, too.

Another implement that is absolutely necessary is the bellows bee-smoker. Don't think you can do without it. There is sometimes offered a "cold-blast" smoker; it costs about 50 cents, while hot-blast smokers cost about double. But my advice is not to use the former. Bees are not so easily subdued with cold smoke, and the beginner needs something that can be depended on when the bees become roused.

Of course, a veil is something that anyone handling bees finds necessary. Again, I will caution beginners not to use cheap goods simply because they are cheap. Buy a veil with a silk front; it offers the least obstruction to the vision. Mosquito bar is sometimes used for bee veils; it does not wear well, and has only cheapness to recommend it. It is difficult, and hard on the eyes, to see through it. Get a broad-brimmed summer hat, over which put the veil, and leave it on. This makes a handy "veil-hat."

The beginner will need gloves, too. Gloves and all clothing should be smooth, not fuzzy wool or felt, and not black. Never use new overalls or smocks; they have an odor very objectionable to the bees. Wash before using. Supply dealers sell regular bee-gloves. They are made of material through which the bees cannot sting. I used gloves only two or three times. You see, they are rather a hindrance in work, and should be discarded, if stings do not cause too much trouble.

Wisconsin.

F. A. STROSCHER.

THE FARM BULLETIN.

A Graduate School of Agriculture.

The fourth session of the Graduate School of Agriculture, under the auspices of Association of American Agricultural Colleges and Experiment Stations, will be held at the Iowa State College, Ames, Iowa, July 4 to 29, 1910. The new Hall of Agriculture, erected and equipped at a cost of \$375,600, will be the seat of activity during the session, but the other buildings and laboratories of the Departments will be available for instruction. The purpose of the Graduate School of Agriculture is to give advanced instruction in the Science of Agriculture, with special reference to the methods of investigating agricultural problems and teaching agricultural subjects. Instruction will be given in eight main lines: Agronomy, Plant Pathology and Physiology, Animal Husbandry, Poultry, Horticulture, Dairying, Rural Engineering, Rural Economics, and Sociology. Attendance at the sessions of this school is limited.