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Farm and Garden

HENS VERSUS INCUBATORS.

Result of Some Recent Experiments in Chicken Raising.
 By JAMES DRYDEN.

Artificial incubation in recent years has assumed large proportions. Large numbers of incubators and brooders are purchased in every community, entailing in the aggregate a large investment of capital. It is admitted that there are great losses in the artificial incubation of eggs and brooding of chicks, and many explanations are



INCUBATOR HOUSE.

given as to the cause. The complaint is that the chicks either fail to hatch or, hatching, they fail to live. Why the embryo should die through the incubation period and die before hatching is a problem that bothers the incubator operator more probably than any other. It is a keen disappointment to the incubator user to find after the eggs apparently have progressed satisfactorily up to the time of hatching that 25 per cent of them, more or less, have failed to hatch. This means a large loss to the poultry man, and if there were no other problem involved in incubation than that of the chicks dying in the shell it would warrant extended investigation. The testimony is very conflicting as to the efficiency of incubators. Hatches as high as 99 to 95 per cent of "fertile" eggs are frequently made and as low as 25 per cent or less. Some claim that the fault is in the stock that laid the eggs. Others claim that the man who runs the incubator is usually to blame in failing to follow instructions, and this is very often the case.

An even more serious problem is to hatch the chicks well. Some claim that it is easy to hatch the chicks, but hard to raise them. Some reports are made to the effect that within four weeks after hatching every chick has died. At certain seasons of the year probably 50 per cent of the incubator chicks die. The cause of this great mortality is usually ascribed to faulty methods of brooding or feeding. The fact that the chick may be hatched with impaired vitality has not been recognized fully. The evidence of vitality should not be merely that the chick survives the brooding period, but that it comes to maturity with vitality equal to that of the parent stock and is capable of transmitting the same vigor and health to the second generation.

A series of carefully conducted investigations at the Oregon Agricultural college has brought out the following facts as to the comparative efficiency of hens and incubators:

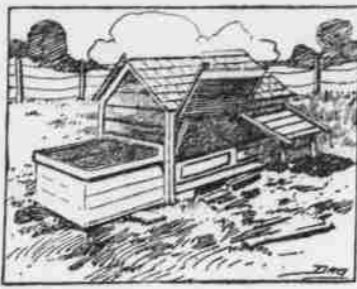
From 570 eggs set, incubators hatched 533 chicks, or 93.5 per cent.
 From 279 eggs hens hatched 219 chicks, or 78.8 per cent.

Eliminating eggs broken in nests, the hens hatched 88.2 per cent of eggs set.
 The incubators hatched 78.5 per cent of "fertile" eggs, and the hens hatched 96.5 per cent.

Eggs incubated artificially tested out 22.7 per cent as infertile, while those incubated by hens tested out 11.8 per cent.

The incubators showed 16.9 per cent of chicks "died in the shell" and the hens 2.8 per cent.

Chicks hatched under hens weighed heavier than chicks hatched in incubators.
 The mortality of hen hatched chicks



COOP FOR SITTING HENS.

brooded in brooders was 30.8 per cent in four weeks and of incubator hatched chicks 23.5 per cent.

The mortality in hen hatched chicks brooded under hens was 2.2 per cent and of incubator chicks 49.2 per cent.

In other tests the mortality was 46.5 per cent for incubator chicks brooded by hens and 58.4 brooded in brooders.

Hen hatched chicks made greater gain in weight than incubator chicks, whether brooded by hens or brooders.

Keep Sowing.

Save something whenever the ground is cleared. Nature abhors bare grounds. Crimson clover is excellent for sowing among all garden crops at the last cultivation. This will live through the winter and may be turned under in spring, thus adding humus and nitrogen to the soil. Rye may be sown for a cover crop, used for spring feed or be turned under as green manure. Rape or turnips may be sown for fall growth and are beneficial to the soil.

DRY ROT IN CORN.

A Disease Which Threatens to Become a Serious Matter.

The name dry rot is derived from the way the ears are affected in the field. "In general the husks tend to turn prematurely yellow to sooty, and the ear becomes partially or wholly shriveled and much decreased in weight. Sometimes the ears remain upright with the husks closely adhering to them. In other cases the husks are weakened, and the affected ears hang limp from their attachment, or the diseased condition may not be detected until the husk is removed."

There are several kinds of dry rot, due to different causes. The most common and that which has during the past two seasons caused about 99 per cent of the damage in Illinois is due to a fungus known as *Diplodia maydis*. Ears infected with this fungus "shriveled up more or less, darkened in color and became light in weight."

The kernels are also shriveled, very brittle and loosely attached to the cob. The fungus penetrates all portions of the ear, kernels, cob and husks and produces many dark brown, two-celled spores which serve to propagate the fungus.

In the case of the *Diplodia* disease and quite probably in that of the other forms the fungus perpetuates itself over winter on the old diseased ears and old stalks. It is not usually difficult to find throughout the summer in old cornfields where the disease has previously prevailed, many pieces of old cornstalks which are infested with the *Diplodia* fungus. Stalks known to be two years old have been found still producing spores. Inuring moist period spores come from these stalks in abundance and are blown singly or in masses long distances, as has been frequently demonstrated by experiment.

The fungus does not, as is often supposed, grow upon any other host and upon developing corn only on the ears. Not so much is known of the other fungi here concerned, but since 90 per cent of the rot is due to *Diplodia* less attention need be given to them. Diseased ears are fruitful sources of subsequent infection and should be removed as promptly as possible. This can be readily done, at the time of husking, if not before. Keep them in a separate receptacle and burn them as soon as practicable. In addition to this, in fields where any considerable amount of disease has been found, the stalks of disease have been found, the stalks should also have attention, whatever crop is to follow. Something may be gained by carefully plowing them under and leaving them well covered, but burning may be required even if this is otherwise bad procedure.

If the first suggestion is always followed and the others are put into practice whenever necessity demands it, these serious losses may be practically prevented.

An Alfalfa Harrow.

The culture of alfalfa has now reached the point in this country where it is creating new lines of industry aside from the growth of the crop. A convention of alfalfa millers was recently held in Kansas. Many people



NEW ALFALFA HARROW.

will be astonished to know that the business of grinding alfalfa hay into meal has reached the point where millers organize their business. Baled alfalfa, according to these millers, is going out of the market, while the ground product has reached an enormous sale.

In the culture of the crop also new tools and methods are being devised. In the southwest particularly it has been found desirable to work the alfalfa over with some shallow working tool which will chop up the ground without cutting off the crop, so as to prevent its sprouting. A recent bulletin from the Arizona station discusses this matter. The proper kind of disk harrow in that country not only quickens up the growth of alfalfa and destroys a large number of weeds, but also helps destroy many insect enemies by turning up their eggs so that they are destroyed. For some time the ordinary disk harrows were used, but a new tool is now being operated. In this tool spikes or teeth like those used on a tooth harrow are fastened to the disk, so that instead of cutting the surface, as a disk harrow does, these teeth chop up and turn over the surface.

General Farm Items.

Only good, sound apples should be used for cider.

The amount of humus in the soil indicates in great measure its richness in nitrogen.

It is claimed that exposed manure loses about one-sixth of its phosphoric acid and more than one-third of its phosphate.

A nail can be driven in hard wood by dipping the point in lard or tallow.

An acre of soil nine inches deep if of ordinary fertility is estimated to weigh about 3,000,000 pounds and contains about 2,000 pounds of nitrogen, 3,000 pounds of phosphoric acid and 6,000 pounds of potash.

According to late statistics, there are at the present time 19,746,000 horses in the United States. This is a gain of 40 per cent during ten years.

ROOT KNOT AND WILT.

Rotation of Crops For Controlling Them in Cotton Growing.

By W. A. ORTON, Bureau of Plant Industry, Washington.

A rotation of crops must be worked out in detail for each farm to fit its particular needs. The essential principles to be observed are as follows:

First.—To use crops immune to root knot in order to starve out the pest.



ROOT KNOT ON COTTON PLANT.

Second.—To build up the fertility of the soil and especially to increase the amount of organic matter or humus.

Third.—To secure an adequate income during each year of the rotation.

Fourth.—To keep the land free from weeds that are liable to root knot.

A list of the crops not liable to root knot which can be used in such rotation follows: Corn, winter oats, rye, wheat, crab grass, iron cowpeas, velvet bean, peanut, beggarweed.

Some of the crops susceptible to nematodes and therefore to be avoided in rotations for root knot are cowpeas (except iron, alfalfa, vetch, soy beans, clover, sugar cane, tomatoes, okra, cucumbers, cantaloupes, watermelons, celery, beans, sweet potatoes, tobacco, potatoes, peaches, figs, nutberries). The iron cowpeas is occasionally slightly infested in Florida, but is practically immune in the cotton belt. Seed of the iron cowpeas containing adulterations of other kinds is dangerous and should be avoided.

Bermuda grass, chufas and summer oats are slightly susceptible, but probably can be used in rotation when root knot is only slightly prevalent. Many weeds are also to be avoided because subject to root knot. The commoner of these are maypop, Indian potato, saw brier, red root or pigweed (amaranthus) and purslane.

The following treatment is suggested for fields infested with both wilt and root knot:

Beginning in the fall, sow winter oats. These may be cut for hay in May or allowed to ripen. Follow the oats with iron cowpeas, sown broadcast or, better, in drills, where they can be cultivated once or twice. Cut these peas for hay and plow the land at once for another crop of winter grain.



YOUNG COTTON PLANT DYING FROM WILT.

This may be prevented by corn, with iron cowpeas or peanuts between the rows. The third year a wilt resistant variety of cotton may be planted.

Wheat or rye may be substituted for oats and the velvet bean for the iron cowpea, especially in the more southern districts.

Considerable relief is often obtained by a single year's rotation with oats followed by crab grass or winter oats or rye followed by iron cowpeas, but not all the nematodes are destroyed. However, it is much more profitable in the long run to practice a three year rotation like that previously described.

The Busy Bee.

There are 300,000 beekeepers in this country and an annual production of honey to the value of \$15,000,000.

Leave all colonies in the best condition possible for winter.

Don't run the comb honey super on weak stocks, it won't work.

Keep the hive covers well painted. The body of the hive needs only a little paint. White is the proper color.

In localities where aster, goldenrod and other fall blooms abound, it is well to look for surplus even in September.

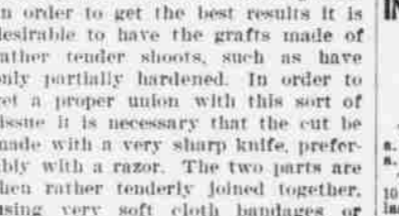
Don't keep the honey on hand too long, as it will not bring more than it will during the next few weeks.

A can of carriage paint will not cost much, but it will make the buggy look better, and you can put it on yourself.

Potatomatoes.

In grafting the tomato on the potato or the potato on tomato, or in making any other graft of similar herbaceous plants, the simpler methods are preferred. The saddle graft and splice graft are the ones most commonly used. The splice graft is made by simply cutting the scions a smooth slanting cut. The stock is cut in the same way, and the two members are tied together with their faces joined.

In order to get the best results it is desirable to have the grafts made of rather tender shoots, such as have only partially hardened. In order to get a proper union with this sort of tissue it is necessary that the cut be made with a very sharp knife, preferably with a razor. The two parts are then rather tenderly joined together, using very soft cloth bandages or



moistened raffia. It is desirable, furthermore, to cover the grafted plant with a bell jar or hand glass of some sort for a few days in order to prevent too rapid evaporation. If it is left exposed to the open air, especially if the atmosphere is rather dry, the scion dries out and withers so badly that it cannot recover. The saddle graft is made by cutting the stock wedge shaped, while the scion is cut with a Y shaped slit so that it will fit down over the wedge of the stock. The rest of the process is carried out exactly as already described for the splice graft.

Fall Care of Orchard.

In sections where the ground is very rough the orchard should not be cultivated, especially in the fall. In hilly sections where the ground does not freeze and where there is a great deal of rainfall during the winter the ground is apt to be mellowed by the cultivation, causing the best part of the soil to wash away during these winter rains. But in sections where the ground will freeze during the winter, in level locations, fall cultivation will prevent the soil from washing away. To turn up the mellow ground to the action of the frost renders many of the insoluble minerals plant food elements available for the trees, which is valuable in developing and maturing the fruit. Cultivate between the rows, allowing the ground to be reasonably porous, so the freezing will be as beneficial as possible, but the dirt must not be allowed to remain in large lumps, which will expose the roots of the trees to the cold weather.

Wood Ashes For Horses.

A little wood ash is held to be very beneficial to horses. It is given a teaspoonful at a time, sprinkled on a feed of oats.

Chemical Action of Manure.

Manures act chemically on soils by adding new stores of plant food, and by their decomposition in the soil they give off carbonic acid gas, which unites with the soil waters and increases its dissolving action on mineral plant food. It also provides the formation of humates in the soil and thus renders inert mineral plant food more available.

Success In Breeding Hogs.

A farmer who has been breeding hogs for twenty-five years and has been unusually successful was asked how he did it. His reply, in substance, was that he provided good, decent quarters, plenty of shade, good pasture, a variety of good food, good water, always fed for vigor and gave the hogs regularly ashes and charcoal. This is all simple, but all good.

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Train No. 101. Lv. Dallas, Sunday only, 6:30 a. m.; ar. Independence, 7:30 a. m.

Train No. 69. Leave Dallas, daily, 1 p. m.; Lv. Monmouth, 1:25 p. m.; ar. Independence, 1:40 p. m. (This train connects at Monmouth for Airlie.)

Train No. 71. Leave Dallas, daily, 7:35 p. m.; Lv. Monmouth, 8 p. m.; ar. Independence, 8:15 p. m.

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Train No. 72. Leave Airlie, daily, 5:05 p. m.; Lv. Monmouth, 5:40 p. m.; ar. Independence, 5:55 p. m.

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