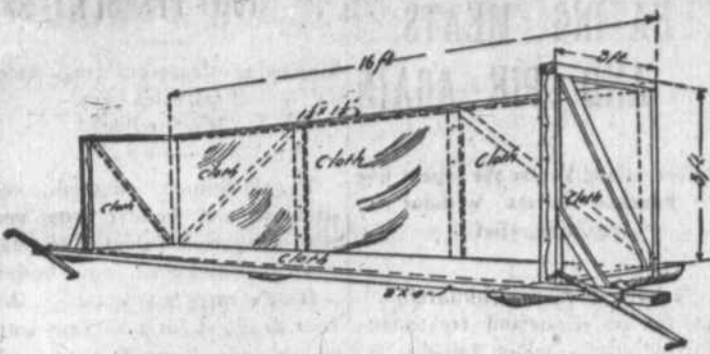


DAMAGE CAUSED BY CLOVER LEAF HOPPERS



CONSTRUCTION OF FRAME FOR HOPPERDOZER.

The clover leafhopper does far more damage than is usually realized. In a publication of the United States department of agriculture (Farmers' Bulletin 787) by Edmund H. Gibson, it is stated that the loss from this cause to the clover and alfalfa hay crops of the country is frequently attributed to poor soil and climatic conditions. For this the minute size of the pest, which frequently enables it to escape observation, is largely responsible. As a matter of fact, continued attacks by the leafhopper, especially in some of the central states, often result in the loss of a considerable percentage of a single cutting.

Crowd Together.
It is characteristic of leafhoppers to crowd together in great numbers, as many as 600 having been counted upon one plant. In feeding upon the plant the insects make tiny punctures. Around these the tissue gradually becomes yellow, the spot enlarging and becoming more pronounced until the leaflets ultimately curl up and the foliage withers. The female also forces her eggs into the stem and leaf tissue, frequently causing a gall-like formation. Alfalfa, clover, cowpeas and vetch are among the principal plants attacked, but the pest is common in meadow and pasture lands and feeds on a number of cultivated as well as native grasses throughout practically the entire country.

The clover leafhopper is about one-eighth of an inch in length and half as wide, and is marked in a manner to distinguish it from many other kinds of clover and alfalfa. The farmer will distinguish leafhoppers from other insects by their habit of jumping, their quick movements, and their minute size. In certain respects they resemble diminutive grasshoppers.

Where It Spends Winter.
As the clover leafhopper spends the winter under clumps of grass, weeds and trash, the burning of rubbish and vegetation during winter months in waste places and along fence rows and roadsides will do much to prevent the pest attaining destructive numbers the following year. This precaution will destroy great number of other hibernating insects as well as the leafhoppers.

During the growing season close cutting or pasturing of grass lands is recommended. Cutting alfalfa crops from a week to ten days earlier than usual will often check the ravages of the insects and may be advisable when there is evidence that the leafhoppers are causing sufficient injury to justify the risk of loss through premature cutting.

Each year this leafhopper, by lessening the vitality of its food plants, occasions more or less damage over its entire range of distribution, causing a positive, although not easily estimated, decrease in the clover and alfalfa hay crops of the country. Continued attacks often result in the loss of a considerable percentage of a single cutting; especially is this true in some of the central states. The leafhopper causes the greatest damage during the spring and early summer months, as the foliage is then most succulent and the tissues very



Favorite Food of Leafhopper.

leather, enabling even the immature leafhoppers readily to pierce the skin of leaf, and stem and suck the juices. The incessant drain from concentrated attacks causes the clover plants to wither, and although they may not die, the new growth which is put forth is very apt to be thin and spindling. With alfalfa it is the first two crops which appear to suffer most. The drain upon alfalfa plants does not show as markedly as with clover, especially during a drought, since the alfalfa roots go deeper into the ground and the plant is better able to withstand adverse conditions.

Known as Flies.
In many localities these leafhoppers are commonly known as "flies," but in reality they resemble flies only in having wings, and because they are about the size of many small flies seen in the fields. The adult or parent insects are light gray in color, but

Success With Corn Crop.
While corn culture under droughty conditions is largely a matter of taking chances with seasonal conditions, certain controllable conditions of soil and seed often determine the success or failure of the crop.

Improves Grade of Butter.
If farmers will improve the grade of their butter, or the cream that is made into butter, they will get a better price for the output of their cow department.

have numerous dark markings which give them a mottled appearance. They are about one-eighth of an inch in length and half as wide.

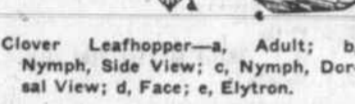
The manner in which they jump from plant to plant is much like that of grasshoppers.

The primary injury is produced by the direct feeding of the leafhoppers. The single tiny feeding puncture is itself inconsequential, and injury results only when a great number of leafhoppers attack the same plant.

The clover leafhopper is distributed generally throughout the United States, records showing its occurrence in every section of the country. Its range also includes southern Canada and Mexico.

The number of generations of the leafhopper produced annually in a given locality varies from year to year, depending on weather conditions, and it also varies in different latitudes and climates. For southern Missouri and northern Arkansas there are usually three distinct broods, covering approximately (1) April and May, (2) June and July, and (3) August and September. Farther south or under subtropical conditions it is probable that there are four or more.

Merely Hide in South.
In the northern states the clover leafhopper hibernates in the adult stage, at the base of clumps of grass and weeds and under dried leaves and trash. Throughout the central and



Clover Leafhopper—*a*, Adult; *b*, Nymph, Side View; *c*, Nymph, Dorsal View; *d*, Face; *e*, Elytron.

southern states it could hardly be said to hibernate; instead, the adults merely keep in hiding and under cover during cold weather, coming out on warm days to bask in the sun and feed upon such green foliage as can be found. In Missouri, for example, the adult insects have been observed feeding upon wheat during January and February, but not in any abundance. Nymphs cannot long survive cold weather, and it is not probable that eggs survive over winter. In the extreme Southwest, where conditions are radically different, the leafhopper is active throughout the entire year.

The adults are quick of movement and jump from plant to plant when disturbed. When strong winds prevail they remain in hiding, as they seem to dislike windy weather. Their most characteristic habit is that of congregating in great numbers on one plant, frequently to such an extent that they crowd one another. This is what causes the concentrated attacks in "spots" throughout a field. The clover leafhopper does not seem to seek shady or damp places, rather preferring the heat of the midday sun.

Nymphs Not Active.
The nymphs are much less active than the adults and are not easily disturbed. When one brushes against the plants they cling fast to the stems and leaves instead of jumping to another plant.

For direct control the hopperdozer is recommended. Any form of this device that is suitable for grasshoppers will do for the clover leafhopper as well, but a much lighter and less expensive one can be made for the smaller insects by stretching canvas over a wooden frame. This can be made of such light weight that it will not injure the alfalfa and clover plant when it is pulled over a field. Two horses, one hitched at either end, are used for drawing it. On the inside of the canvas a thin coat of a sticky substance made of tree tanglefoot which has been thinned with cheap castor oil is spread with a paddle or shingle. As the leafhoppers and other insects alight on the surface of this substance they are held fast. Such substances as cheap sorghum have been tried in place of tree tanglefoot. The sorghum, however, dries out too quickly and frequent applications of it have to be made. It is best to draw the hopperdozer through the fields when the crop is about half grown.

PREVENT SCAB OF POTATOES
Treatment With Disinfecting Solution Is Recommended to Guard Against Fungous Diseases.

Treating seed potatoes with a disinfecting solution to prevent scab and other fungous diseases is but little trouble, and the expense is small. An hour's time and a half-dollar expended for the purpose will often add \$25 to \$50 to the value of the crop from an acre of potatoes.

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Good Place for Harness.
Provide a good place for the harness. Falling from hooks behind the horses and being tramped in the manure is carelessness.

Mud Hole Unnecessary.
A mud hole is not a necessity for the pigs. The sanitary wallow that disinfects them is by far the best.

LIVE-STOCK-FRUIT-DAIRYING-GARDENING-FIELD CROPS-SILOS-IGS

FARM AND FIELD

New Wrinkles in Progressive Agriculture

Making the Farmers' Business Profitable

TOLD IN AN INTERESTING MANNER EXPRESSLY FOR OUR READERS

SELECTING BEST HERD BOAR

Why Is It Important for Breeder to Choose Animal With Much Care—Some Suggestions.

(By W. T. WASEL, Colorado Agricultural College, Fort Collins.)
The time is approaching when the hog breeder must select and mate his breeding herd. It is of prime importance that the boar be selected with care. The expression "The male is half of the herd," is often quoted. This by experience has been found true. There is a uniform nepotency in both sexes; thus, the influence of the two



Duroc-Jersey Boar.

parents on the offspring is theoretically equal. However, the boar has the greater influence on the herd. Each pig in the herd is sired by the one boar, but there are several dams.
A well-selected male used on a herd of inferior sows will make a great improvement in the offspring. However, the use of an inferior boar on wellbred sows will have a correspondingly bad result. The breeder should select his herd boar at an early date, and get him accustomed to his new surroundings. The system of feeding and management is very important in getting the male into the best condition before mating.

PROBLEM OF WARMING FEED

Resourceful Farmer Makes Use of Two Barrels and Fresh Manure to Heat Slop for Hogs.

(By R. C. ASHBY, University Farm, St. Paul.)
A resourceful Minnesota farmer reports that he has solved the problem of warming the slop-feed for his hogs. Two barrels are placed near the feeding troughs and a day's supply of feed is placed in each. The barrels are heavily banked with fresh manure from the horse barn. The heating of the pile warms the feed in the barrels, as each day's supply stands for 24 hours before using. Whenever necessary the banking is hauled away and a new supply packed onto the barrels.

Opinions differ as to the relative efficiency of slop-feeding and dry-feeding, but disregarding the matter of efficiency, some hog raisers prefer slop-feeding for brood sows in winter for another reason. In winter hogs do not drink enough water unless the water is warm or supplied at frequent intervals. By mixing water with the grain the feeder controls the amount of water consumed by his hogs.

MAKING USE OF ROUGH LAND

Acres Not Suitable for Regular Farm Crops Will Support Sheep With Little Expense.
Every farmer with a few acres of pasture has a good chance to raise sheep. On many farms there are a few acres of rough lands not suitable for regular farm crops. This land with the proper attention would support a few sheep perhaps with very little extra expense for feed.

GARDEN WASTES ARE USEFUL

Pig Is Primary Waste-User and Must Be Kept in Its Place—Avoid Buying Feeds.
The pig that has to live exclusively on bought foods will cost more than its pork is worth, unless it is given a special valuation for home use.
The pig is primarily a waste user, and it must be kept in its place. Make it use the garden wastes.

ALFALFA IS CHEAPEST FEED

Profitable to Have Rack Filled With Third or Fourth Cutting Available All the Time.
It is without doubt profitable to have a rack filled with good third or fourth cutting of alfalfa available all the time so every bunch of hogs on the farm can eat this hay at their pleasure. It is the cheapest feed we have.

Overworked Horse.
When a horse won't eat just after coming in from a day's work, you have stuck to your job too long. Doesn't pay you nor the horse, either.

Salt for Horses.
A brick of salt should be in every horse stall. There is no danger then of oversalting, and the horses always have what they need.

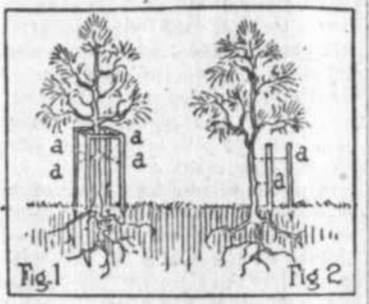
Salt Is Sheep Medicine.
Salt is medicine to a sheep, and it is cheap medicine at that.

HELP SWAYING YOUNG TREES

Much Injury Can Be Prevented by Employing Stakes as Shown in Illustration Herewith.

Many young trees, through the action of the wind, weave about and wear an opening in the soil at their base, thus admitting water and air to their detriment. One can keep a close watch and straighten up these loosened, swaying trees, filling in around them as necessary, especially after strong winds, which usually accompany a rain that has made the ground soft and yielding, but sometimes this is not done till incalculable damage has been done the trees. The preventives illustrated are preferable to the "cure," writes M. Coverdell of Iowa in Farm and Home.

In Fig. 1 four stakes are driven firmly in the ground and soft strings, a, run from stakes to tree trunk, allowing only slight movement of trees. In Fig. 2 one stake is driven on the north side of tree and one on west side. Stiff sticks, a, are securely tied to stakes and trunk of tree. Sticks must be wrapped with cloth



where they come in contact with tree. This also is a fine method of straightening up a tree with a crooked trunk, one of the stiff sticks being bound to the trunk at a point considerably higher than the other, and a third stick attached to the stake, lower down on the trunk. The length of these sticks will be determined by the crook of the tree, they being arranged so as to pull it straight. Sticks should be forked, to facilitate fastening to trunk of tree.

MANURE NEEDS FOR ORCHARD

Where Soil Was Originally Thin Dressing May Be Required to Keep Trees Growing.

After fruit trees bear a few years, if the soil was originally thin, a dressing of barnyard manure may be needed to keep the trees in growing condition and to insure the formation of fruit buds. It will be required that the trees grow every year in order that they may form fruit buds. Since growth is necessary, nitrogen in the soil will be necessary also. Warm soil may lack available nitrogen, hence the need of barnyard manure or commercial nitrogen.

Old orchard soils may need organic matter. This the barnyard manure will also supply. There is no other fertility that will stimulate growth on trees better than barnyard manure, for it affords both organic matter and nitrogen.

In applying manure to large trees do not make the mistake of applying the manure close to the tree, around the trunk. The young roots where the plant food is to be obtained for old trees may be considerable distance from the trunk of the tree. It is a good practice to spread the manure as far away from the trunk as the branches extend, possibly farther. This will provide that the manure is above many of the roots that are to absorb plant food.

WINTER WORK IN ORCHARDS

Cut Away Dead Limbs and Use for Fuel—Remove Dying Trees and Destroy Insects.

Any time during the winter when we have time we can cut away all the dead limbs in the orchard and cut them up into fuel for the cook stove. The chances are we will be getting rid of a number of bugs and worms that are lying dormant, waiting for spring to begin destroying tree or fruit.

Dead or dying trees can be removed and the ground made into fine condition to receive a young tree.

Dynamite out the old tree and leave the hole exposed during the winter and the insects around there will be destroyed.

TIME TO PRUNE GRAPEVINES

In Cold Climates It Is Well to Wait Until Severe Cold Weather Is Practically Over.

In mild climates November is the time to prune grapevines; but in very cold localities it is safer to delay the pruning until severe cold is practically over—say the latter part of February.

Cut back new wood so as to leave only two or three buds on each cane.

Small Bush Fruits.
Currants and gooseberries produce fruit on the wood that is two and three years old. Raspberries, blackberries and dewberries produce their fruit on wood of the previous year's growth and the old canes should be discarded at once.

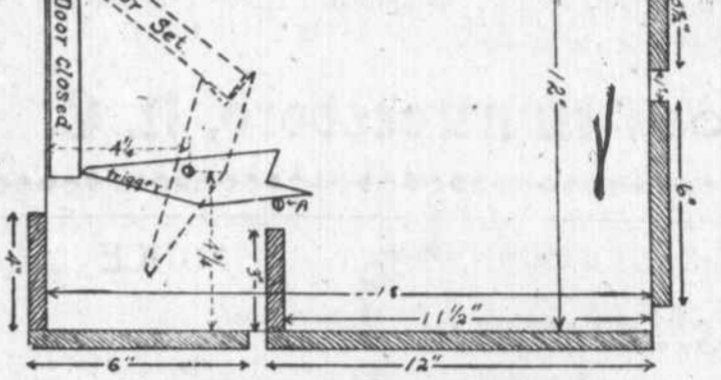
MISSOURI TRAP NEST IS SATISFACTORY

(By T. E. QUISENBERRY, Missouri State Poultry Experiment Station.)
There are many kinds of homemade trap nests, but none have proved so satisfactory with us as this one. The nests are of good size, 12 by 18 inches inside measure and 12 to 15 inches high. A board 3 inches high is put across the nest 12 inches from the back, which makes a nest 12 inches square, and this board holds the nesting material in place. The nests should be built in pairs. This makes a nest in which a good large hen can be comfortable either sitting or standing which is a desirable quality in a trap nest. This door and trigger can be used on any sort of nest or box you care to use.

The body of the nest is built of light material, one-half of five-eighths inch lumber. The trigger and front door should be made of seven-eighths or inch material. Nests which are to be placed under tight droppings platform or underneath any object which will prevent the fowls from roosting on them need be covered only with one-

absolutely prevent the trigger from binding against the side. Free action of this trigger is positively required.
Setting the Trigger.
The trigger must be set in such a position that when the door is swung inward and rests on the notch it will be invitingly open and at the same time this opening must be small enough to prevent the hen walking into the nest without touching the door with her back. As she steps into the nest and slightly raises the door, the trigger is released and falls backward. The door then swings down and the pointed end of the trigger rises behind it, effectually locking it.

See that the nesting material does not interfere with the trigger. Long hay or straw may eventually get piled up in such a manner as to interfere with its action. To remove the hen, simply turn the button and swing the door outward, or if you prefer, turn down the point of the trigger and swing the door in toward the top of the nest, thus permitting the bird to come out. Of course the nest can be



LEFT INSIDE WALL OF NEST AS IT FACES YOU.

inch mesh poultry netting. Otherwise make the top of the nest tight. It is a good idea to leave an inch opening in the back or sides of the nests for ventilation.

Wire Door Favored.
Use a door consisting of a frame over which small mesh wire has been tacked. We like the wire door better than a solid wooden door, because of the fact that it affords ample ventilation, the lack of which is one of the main faults of the average trap nest. The door is hung on screw eyes, which fasten in the upper edge of the frame. With a gimlet or small bit make holes in sides and partition for heavy wire near top entrance, from which suspend the doors by screw eyes. This permits the doors to swing back and forth freely, and makes a cheap hinge.

The door is checked by means of thumb buttons, which are placed on the front of the center partition and act as a stop for both doors. If you should be troubled with the buttons working loose, tighten them.

The trigger can be attached to the side of the nest box by using a long screw, but in every case it must work freely. The screw must be set squarely into the side of the box to set in a partition with a back door through which the hen may be removed.

It is necessary to drive a nail into the side of the box in such a manner as to check the falling trigger, when the sharp end rises to a point where it safely locks the door. The point of the trigger should rest near the bottom of the door when it is closed. The trigger resting on the back of the door prevents any hen on the outside from coming in and the door closing against the button prevents the hen in the nest from releasing herself.

Prefer Secluded Spot.
The hens prefer to lay in some secluded spot. Don't put the nest too light. The hens see the soft shelled eggs and the broken eggs, and they often develop the habit of egg-eating. The nests should be simple and constructed so they may be easily removed.

We prefer to place the nests under the droppings platform. This is a convenient place, and the nests do not occupy any of the valuable floor or wall space. You should have one nest to every four hens. Keep the nests absolutely clean and remove the nesting material quite often.

HOME-MADE INSECT KILLERS

Get Chicken Houses and Floors Cleared of Dust and Dirt Before Applying Insecticides.

With the increased price of drugs, it behooves us to make every drop count, by getting the chicken house and the floors cleaned of dust and dirt before applying. The first step is to remove all movable furniture, clear out the litter from the floor, taking with it, if a dirt floor, the first two or three inches. Then sweep down walls, ceilings and rafters. A hot spray of soapuds or salt water will kill wherever it reaches; but the mites hide in corners, under slivers, and in knot-holes, where it is hard to get to them. An ounce of carbolic acid to a gallon of whitewash will smother the mites and lighten up the house. No treatment will rid a house of mites on the first trial; it is necessary to treat three times, at intervals of ten days. A gallon of kerosene, to which has been added a pound of naphthaline, makes a good paint for going over the wood-work hard to reach with the spray, and also is good for the roosts. Shake well each time before using.

DAMAGED FEED FOR POULTRY

At Present Prices Poultryman May Find It Economical to Buy Good Grade of Salvage.

In buying salvage wheat the factor of whether or not the chickens will eat it is very important. There are two kinds of salvage wheat. One is water soaked, which when it comes through a fire smells very strong and has a bad taste. The hen will turn this down every time.

Fires occurring in elevators where there are no fire-fighting facilities leave the wheat in a better condition. There may be a little chattered wheat in it, but the fiery and water-soaked odor is not present; consequently the palatability of the grain is not much affected. At the present prices one may find it paying to feed a good grade of salvage.

FEEDS FOR BREEDING STOCK

Keep in Mind Importance of Materials Carrying Proper Proportion of Protein and Fat.

In feeding your breeding stock, keep well in mind the importance of balanced feeds, those carrying the proper proportion of protein, carbohydrates and fats.

Make regular use of hoppers to contain mash feeds and beef scrap, either of which poultry can have access to at all times; also the grit, oyster shell and charcoal. The hens are wiser than many give them credit for, and will, if given this chance, do their own "balancing."



DAIRY FACTS

TO OBTAIN HEALTHFUL MILK

Cows, Barns and Yards Must Be Kept Clean—Small Top Pails Keep Out Foreign Matter.

(By V. R. JONES, Dairy Husbandry Department, South Dakota State College.)
Cows must be healthy and kept clean.

Barns should be kept clean, well lighted and ventilated.

The barnyard should be kept clean and properly drained.

Utensils should be thoroughly washed and scalded or steamed and kept in a clean room.

Cows should be fed good wholesome food and pure water.

Milkers and attendants who come in contact with the milk should be healthy and clean.

Cows should not be fed at milking time or immediately before. Dust from feed falls into the milk and contaminates it with germs.

Wipe the udder and side of cow with a damp cloth and milk with clean, dry hand.

Use small-topped milking pail. This helps to keep foreign matter from the milk.

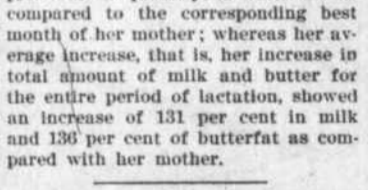
Remove the milk immediately after milking to a separate room from the barn to be strained and cooled. Cool milk to as low a temperature as possible without freezing. Forty or fifty degrees F. retards growth of most germs, and particularly those that cause milk to sour quickly.

SCRUB COWS AND DAUGHTERS

Iowa College Makes Interesting and Instructive Comparison—Record of Holstein Grade.

A very interesting and instructive comparison is made between the records of individual scrub cows and their own grade daughters as shown by experiments at the Iowa college.

The best monthly record of one Holstein grade shows an increase of 67 per cent in amount of milk and 33 per cent in the amount of butterfat as compared with the best monthly record of her dam, this being the best monthly record for these two cows during three lactation periods for each one. The average for the three lactation pe-



Holstein Dairy Cow.

riods shows that the Holstein cross had an increased production of 101 per cent in milk and 53 1/2 per cent in fat as compared with her mother, which was one of the original scrubs.

One Guernsey cross showed an increase of 110 per cent in milk and 107 per cent in quantity of butterfat as compared to the corresponding best month of her mother; whereas her average increase, that is, her increase in total amount of milk and butter for the entire period of lactation, showed an increase of 131 per cent in milk and 136 per cent of butterfat as compared with her mother.

EARLY AND GENTLE TRAINING

Task of Halter-Breaking Heifer Calves Cannot Be Begun Too Early—Handle Them Daily.

Halter-break all the heifer calves before they get very large. Can't do it too soon. No matter whether you ever lead your cows or not you want them broke to lead. Handle the calves daily as they grow. Rub them, fool around their hind quarters so that they will not be scared or ticklish the first time they are milked.

FOR PURE DAIRY PRODUCTS

Clean Milk, Quick Cooling and Prompt Delivery Are Factors of Much Importance.

The number of bacteria in milk depends largely upon cleanliness of milking and handling, temperature at which milk is kept and age of milk. Therefore, clean milk, quick cooling, and prompt delivery are very important factors in producing pure dairy products.

PRODUCT OF IMPROVED COW

Wild Animal Gave Only Enough Milk to Nourish Its Young—30,000 Pounds Yearly Now.

The wild cow gave only enough milk to support its young. Proof of what man has been able to do in improving dairy cattle is found in the fact that production is more than 30,000 pounds, the present world's record for milk per year.

Temperature of Water.
Wash-water used in the churn should be approximately the same temperature as the buttermilk, or within two degrees of it.

Stool Facilitates Milking.
A milking-stool of proper height will enable most milkers to handle fully one-third more cows without fatigue than if it is too low.