Just in Passing...

"Dusted Off" for Cattle Feeders

When the group of Iowa farmers from the farm business associations were studying the publication setup at Iowa State College in 1939, they recommended the publication of a periodical such as the Farm Science Reporter.

Among the things which they suggested be printed in such a magazine would be a review of experiments completed several years ago, the results of which are still applicable but not in print.

In this issue we have pulled off the shelf of the older experiments one which we thought might interest Iowa cattle feeders. It is the article on self-feeding of cattle. A good deal of discussion has been carried on, because of the shortage of help on farms, about self-feeding cattle as a means of cutting labor corners.

The tests which were run in the winters of 1915-16 and 1916-17 were not made as a test of labor saving, but rather to find out whether or not cattle could be self-fed and how the results would compare with hand-feeding.

The experiments at that time were under the direction of John M. Evard. His successor, C. C. Culbertson, was interviewed to find out what he knew about the practicability of self-feeding cattle as a labor-saving means.

We did not review this experiment in great detail, but rather have given you only the simple conclusions of the results from self-feeding cattle as revealed by these two experiments.

The Authors

H. D. Hughes, who has been head of the farm crops work at Iowa State College for many years, presents the case of red clover for Iowa farms. Co-author is C. P. Wilsie, research associate professor of the Agrobiology Section of the Iowa Agricultural Experiment Station. Mr. Wilsie has contributed to the Reporter previously too.

Anthony Mathis is a recent graduate of Iowa State College, having majored in animal husbandry. He has served as editor of the Iowa Agriculturist, student monthly magazine of the Agriculture Division of the college. Mr. Mathis farmed for several years in Dubuque County, Iowa, after finishing high school and before he entered college.

C. J. Drake is head of the Entomology and Zoology Department of Iowa State College and serves as state entomologist. He is known to many Iowa farmers.

G. C. Decker works part time for the Extension Service of Iowa State College and part time for the Experiment Station. He and Dr. Drake discuss screwworms in this issue. At present Dr. Decker is spending considerable time studying the corn borer situation in Iowa.

C. C. Culbertson heads the Animal Production Subsection of the Iowa Station. The final word of the results of the 1942-43 cattle feeding experiments are reported in his article in this issue.

H. M. Harris is professor of zoology and entomology at Iowa State College. He writes in this issue with collaboration of Dr. Drake on the control of cutworms, armyworms and grasshoppers.

Helen Virginia Johnson discusses pressure cookers, how they are built, how to operate and care for them. Miss Johnson received her M.S. degree at Iowa State College a year ago and was retained as an instructor in the Household Equipment Department the past year. Her home is Sioux City. In addition to her knowledge of household equipment, she is an artist and has exhibited paintings.

CONTENTS

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iowa Needs Red Clover</td>
<td>3</td>
</tr>
<tr>
<td>Shall We Self-Feed Cattle?</td>
<td>7</td>
</tr>
<tr>
<td>Controlling Screwworms</td>
<td>8</td>
</tr>
<tr>
<td>Chop Hay for Steers?</td>
<td>10</td>
</tr>
<tr>
<td>Lamb Feeding Trials</td>
<td>11</td>
</tr>
<tr>
<td>When to Plow Sweet Clover</td>
<td>11</td>
</tr>
<tr>
<td>New Bait for Worms, Hoppers</td>
<td>12</td>
</tr>
<tr>
<td>Your Pressure Cooker</td>
<td>14</td>
</tr>
<tr>
<td>Freezing Fruits, Vegetables</td>
<td>16</td>
</tr>
</tbody>
</table>

H. H. Plagge is research assistant professor of horticulture at the Iowa Station. He has been working for several years on preserving fruits and vegetables through freezing and is an outstanding authority on the subject.

Are the Tile Working?

Many of Iowa's fertile farms that are producing so much food to feed the world are able to do so because years ago the sloughs, ponds and low spots which were too wet to produce crops were drained by tile and open ditches.

But the tile and open drainage ditches were made so long ago that some of them now need a thorough inspection and, in some instances, cleaning out or repair.

One of the articles planned for a future issue of the Reporter will deal with this subject. C. H. Van Vlack, who heads the extension agricultural engineering force at Iowa State College, is working on the article.

In a spring of heavy rainfall it is not hard to locate the spots in fields where the drainage system is not working properly.

Rate and Date of Soybean Planting

The middle of May usually is the best time to plant soybeans and the best rate of planting is about 1 bushel an acre.

This is the conclusion reached at the Iowa Station from 3 years of experiments which included five different rates and five different dates of planting. The rates varied from 0.6 bushel to 2.2 bushels an acre, planted in rows 32 inches apart.

The dates of planting for the 3 years (1939, 1940 and 1941) were May 1, May 12, May 23, June 3 and June 14.

FARM SCIENCE REPORTER

Editor: Fred E. Ferguson
Home Economics Editor: Mary A. Burnham
Art Director: Sidney H. Horn

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RED CLOVER, the old standby rotation legume of our fathers and grandfathers, was shoved back a few years ago by newer and seemingly more promising legumes.

But we think red clover still has an important place in our crop system on many Iowa farms. It will grow and produce a good crop on much land that is too acid for alfalfa and sweet clover, the two newer legumes which have probably done most of the pushing of red clover into the background.

Some of the characteristics which give red clover its position of outstanding value as a legume to be included regularly in rotation with grain crops are:

1. It's adapted to a wide range of soil conditions.
2. It yields high either for hay or pasture.
3. It's adapted for hay or pasture either alone or mixed with grasses and other clovers.
4. It will yield two crops and a good aftermath.
5. It has high value as a soil improving crop in the rotation — at the same time permitting the harvest of one or two crops for hay, or hay and seed.

Alfalfa is a wonderful crop and the acreage has increased in Iowa from a few thousand to well over a million acres. Sweet clover, once regarded as a weed, is now recognized as having great value as a soil improving crop and as a legume giving large acre returns for pasture, especially when used in mixtures with other clovers and grasses.

But neither alfalfa nor sweet clover can tolerate acid soil conditions. So many of our Iowa soils must be limed to grow these crops successfully. This constitutes one of the most important barriers to their more general use.

Red clover, however, is not a "foolproof" crop. In the past much unadapted foreign seed was imported and gave poor results. With the loss of organic matter from our soils, they dry out more quickly than formerly, and some clover stands have been lost because of the surface soil drying out.

Although red clover has a greater tolerance for acid soils than alfalfa or sweet clover, the best results are obtained when the soil is well supplied with calcium and available phosphorus. Finally, the time of cutting and method of curing the hay crop largely determine the total production of high quality feed.

Use Suitable Soil

Failures to get and maintain good stands of red clover are due mainly to unfavorable soil conditions. On farms that have been under cultivation for many years, deficiencies in lime, phosphorus and organic matter may greatly limit clover production. Fortunately, red clover has a wider range of soil adaptation than alfalfa or sweet clover and will produce good crops on soils that are not too fussy about a soil that's a bit acid; it makes good hay or pasture.
top acid for either of these legumes. On soils that are distinctly acid, however, we strongly recommend an application of ground limestone. There is a big advantage in applying lime several months in advance of seeding.

Lack of sufficient available phosphorus is likely to be one of the most serious limiting factors in clover growing. Superphosphate — usually applied at rates of 150 to 250 pounds per acre — may mean the difference between success and failure. Superphosphate is applied just before seeding and is worked into the soil during seedbed preparation.

When rainfall is deficient, seedings of alfalfa or sweet clover usually are more certain of establishment than red clover. This is because the alfalfa and sweet clover seedlings have more vigorous early growth and deeper rooting. The surface soil is more likely to dry out to the depth of the red clover seedling roots.

Most of our red clover and other clovers, as well as alfalfa, are seeded in the spring with a small grain nurse crop. The high organic matter content in the surface soil has largely disappeared through the years that Iowa land has been under the plow. The result is that our soils have lost their water-holding capacity and dry out relatively quickly, as compared with previous years. Consequently, the proportion of our clover and grass seedings that fail to make a stand has increased.

Establishing Stands

What can we do to eliminate some of these failures in stands? We must counteract the effect of this lower organic matter content, and to do this we recommend the following practices as especially important.

1. Use a short-strawed nurse crop. The early varieties of oats and barley are equally good; flax is exceptionally good.

2. Cut down the rate of small grain seeded to half the amount usually sown. This will not greatly reduce the yield of grain and will benefit the clover, especially if growing conditions become critical.

3. Use the small grain for pasture. This is one of the best practices in establishing clover seedings. Cutting the small grain for hay when in the milk stage has often saved seedings that otherwise would have been lost. Clipping earlier in the season and leaving the grain as a mulch also favors new seedings.

4. Firm the seedbed with a corrugated roller or cultipacker before seeding if this is possible and if the soil is at all dry. Then broadcast the seed and use the cultipacker again. This method of seeding seems to be particularly superior to others. The seed are placed in the soil at the best depth and the rolling firms the soil particles about the seed. If dry weather immediately follows seeding, the use of the cultipacker may mean the difference between success and failure.

5. Plant early. Get the small grain and clover seeded as soon as the season will permit.

6. Inoculate the seed before planting if red clover has not been grown with good success on this land in recent years. The cost is low, and if the red clover bacteria are not present the crop cannot succeed.

7. Clip the stubble of the small grain nurse crop during the last 2 weeks of August. This practice has been found helpful in bringing new seedings through the winter.
Use Adapted Strain

In past years as much as 12 million pounds of European red clover seed has been imported into the United States. In certain years large quantities of seed also have come in from the Argentine. This seed went into commercial channels and was lost sight of. The source of red clover seed or its adaptation was not questioned.

When the United States Department of Agriculture, in cooperation with the different Corn Belt Experiment Stations, initiated field tests with red clover seed from different sources, it was found that the great bulk of this seed was coming from southern Europe and that it was not winter hardy.

But regardless of the source of seed, the European type of clover was found to be unsuited to production in the United States. It gave lower yields of hay, almost never gave a seed crop, and was subject to serious winterkilling. The European type of red clover is subject to damage by the leafhopper, as in contrast with our American red clover which is protected from the attacks of this insect by a hairy covering on the stems and leaves. This is believed largely responsible for the unsatisfactory results from the imported seed.

Federal legislation now requires the staining of all imported red clover seed 10 percent red, except that from Canada which is stained 1 percent violet.

Many trials have been made throughout the Corn Belt with regional strains of red clover from the different states. In general, these tests have shown that seed from the Corn Belt states or from the red clover seed producing areas in Idaho and Colorado may be expected to give entirely satisfactory results. Local strains from Oregon, tracing to red clover grown in that area for many years, are not recommended because of lack of winter hardiness.

In the last few years two new varieties have appeared on the market, Midland and Cumberland. Midland was developed by combining several superior Corn Belt strains into a composite variety. Foundation seed stocks are maintained in the several Corn Belt states, while commercial certified seed is produced largely in Idaho, Colorado and Washington. Midland red clover is well adapted to Iowa for general use. It has proved to be winter hardy over a wide range of conditions in the north central states and is somewhat resistant to the clover disease known as northern...
anthracnose.

Cumberland red clover, a composite of superior southern strains, while highly productive and quite desirable for states farther south, seems to be somewhat susceptible to winter injury in Iowa.

Red clover from Canada is likely to be somewhat smaller in growth and may mature earlier than strains from the Corn Belt states.

Free of Noxious Weeds

Use care in buying red clover seed to be sure it is free from noxious weed seed. The Iowa Seed Law provides that all lots of seed offered for sale shall be labeled giving complete information as to seed qualities, including the presence of any noxious weeds. The sale of seed containing certain primary noxious weeds is prohibited. The buyer should insist that all seed he purchases be labeled according to the provisions of the state seed law.

Cut First Crop Early

In the southern half of Iowa a relatively large acreage of red clover is grown alone. The first cutting on much of this acreage is taken for hay and the second cutting for seed. Or the first cutting may be taken for hay and the second cutting also harvested for hay or used for pasture.

A large acreage in southern Iowa also is grown in a mixture with timothy. In eastern Iowa and northeastern Iowa most of the red clover is grown in mixtures with timothy, with alsike also included in many cases.

The chief advantage in growing clover for hay, as compared with one of the grasses, is its high protein content. The maximum production of protein on an acre basis is obtained by cutting the clover when not later than in full bloom.

This is earlier than most red clover is cut. In many fields considerable portions of the clover heads are allowed to become brown and dry before they are harvested. This is too late for the best quality of hay, for total production and for maximum yield of protein.

There is a second advantage in early cutting of red clover — even a little before the full bloom stage — it favors the setting of a possible seed crop in the second cutting. A good seed crop often is uncertain.

Bees Help Seed Crop

The one thing the grower can do which may have a greater influence on seed setting than anything else is to harvest the first cutting early. Another thing which may help is to locate a number of colonies of honeybees in or near the red clover field. Some evidence indicates that seed yields may be increased considerably by supplying additional numbers of pollinating insects.
Shall We Self-Feed Cattle?

SELF-FEEDING cattle has been considered a labor-saving practice in the past and may therefore increase this year. However, C. C. Culbertson, who is in charge of feeding experiments at the Iowa Station, doubts the value of self-feeding cattle to save labor.

According to him, the value of self-feeding is rather that it allows a better distribution of labor and prevents irregularities in feeding which may result from pressure of work. Self-feeders with large hoppers need be filled only at intervals of a week or ten days. Therefore the farmer who is quite busy with field work or other tasks can do the chore on slack days or in between other jobs, whenever it is handy.

On farms where working hours are irregular and chore time is likely to be equally irregular, self-feeding may be an advisable practice. Cattle do best when fed at regular hours, and self-feeding gives them a chance to eat when they want feed.

In two experiments carried out at Iowa State College, self-fed steers gained an average of 0.4 pound daily more than hand-fed steers that were on full feed in one test and 0.13 in the other. Also, their gains were made at a slightly lower feed cost. Work at other stations also indicates that the difference in feed costs between the two methods is small.

Some farmers fear that they will have trouble with cattle going off feed now that inexperienced help may have to be used for chore work. They have been wondering whether self-feeding would be the answer to this problem. Culbertson states that there is little danger of getting cattle ‘stuck’ when they are on limited grain rations if the person feeding is told how much to give the cattle.

Full-feeding by hand, however, requires good management backed by experience and daily attention. Inexperienced help cannot be safely used for full-feeding. The farmer who makes money feeding cattle sends the hired man into the field and does the chores himself. “The eye of the master fattens the cattle.”

If supplements or a mixture of grains is fed, grinding may be necessary to get an even mixture. This means added work and expense, and perhaps the difference between profit and loss.

Even with shelled or cracked corn, careful adjustment of the self-feeder is necessary to get a proper flow of grain into the trough. Cattle will mess over a too large supply of grain in their trough and finally refuse it. If insufficient feed comes into the trough, the feeding will be limited, and the cattle will not get enough grain.

Can Fatten on Silage

For limited grain feeding, Culbertson advises a full feed of corn silage, and a limited feeding of legume hay as well as grain. Silage makes the greatest possible amount of beef from each acre of corn, and we may need all the feed we can get this year. Many seedings were damaged last winter. Silage can replace some of this lost roughage as well as provide some of the corn necessary to finish cattle. In fact, the Michigan Agricultural Experiment Station has successfully fed out steers using silage and legume hay with no added grain. Silage from some of the high-yielding hybrid corn varieties may contain as much as 20 percent grain. A heavy feed of good corn silage would give the cattle considerable grain.

The finish obtained in limited grain feeding is not as good as with full feeding. However the last gains put on cattle always take more feed, and, unless a premium is paid for highly finished cattle, more profit may at times be obtained from partly finished steers than from those that top the market.

Hog mange is caused by a mite which lives beneath the skin and causes intense irritation. A portable wallow in which hogs may dip themselves will save labor in controlling the disease. A leaflet entitled “Portable Hog Wallow,” which includes a picture and plans for the equipment, can be obtained through county extension directors or from the Agricultural Extension Service, Iowa State College, Ames.
A new insect pest — the primary screwworm fly — has been moving into Iowa during recent summers to pester and kill some livestock. Two outbreaks were reported in June this year in southern Iowa and more may follow.

This new pest is from the South. It lays eggs about fresh wounds of livestock, and maggots develop which work on the live flesh of the animal, causing sharp pain, bleeding and possible death, depending on the place and extent of the attacks.

Fortunately, the screwworm cannot live through Iowa’s cold winters, so the problem is one of recognizing the pest when it goes to work and of controlling or preventing its entrance to fresh wounds. It is a pest of major importance in Texas and other southern states. The first outbreak in Iowa was in 1934.

Because it cannot live through Iowa winters, outbreaks as early as June indicate that it has been brought in with shipments of infested animals. Infestation later in the summer or fall may also result from such shipments or from the northern migration of the adult screwworm fly. The sporadic outbreaks in Iowa usually may be attributed to shipments of infested animals from southern states. The screwworm overwinters only in the southern portions of Texas and Florida.

How to Know Worm

The adult screwworm fly is a deep bluish metallic colored, two-winged fly, a little larger than the ordinary housefly. It has three dark stripes along the back between the wings and a yellowish-red face. It closely resembles certain blowflies in the adult and immature stages.

Farmers can easily distinguish wounds or sores infested with screwworm maggots from those infested by other maggots. The screwworm maggot lives only in live flesh, thus causing bleeding and acute pain. Although several different kinds of maggots are found in wounds of living animals, when screwworms are present there is always a distinctly bloody, pus-discharging, foul-smelling wound. Also, there is usually a hard swelling around the wound. But the bloody discharge is the sure sign, for blowfly maggots do not cause bleeding.

Animals infested with screwworms soon become weak and thin; they refuse to eat and frequently stray away from the rest of the herd. These individuals hide themselves in underbrush, timber, strawstacks, buildings or other secluded places in an attempt to get away from tormenting flies. This habit often makes it difficult to find infested animals in time for early treatment.

As more and more screwworm flies are attracted to the untreated wounds for egg-laying, a large number of maggots of various sizes are sometimes found in one wound. Also, as the maggots live on living flesh, the wounds are constantly increasing in size. Animals not found and promptly treated often die in a few days. How long animals infested with screwworms live depends upon the location of the wound and number of maggots present.

Blowfly maggots usually infest older wounds. They feed on dead and diseased flesh and are said to be beneficial sometimes for that reason. They cause no bleeding or hemorrhages.

Under normal conditions most of the maggots you will find in livestock wounds in Iowa are not the primary screwworm. For practical purposes, however, you need to consider all maggots in wounds undesirable and treat the wounds as you would for screwworm. Screwworms attack any warm-blooded animal, and the place of attack on the body depends upon the location and type of injury or blood clot that attracts the flies.

The Remedy

Up until about 1941, recommendations usually called for two treatments — one to kill the maggots in the wound and the second to prevent reinestation of the treated wound. But now, thanks to the recent research by the U. S. Bureau of Entomology and Plant Quarantine, there is a new remedy known as Smear No. 62 which does the whole job in one treatment. It destroys the eggs and kills the maggots.

Your county extension director has leaflets on screwworm control and the names of dealers handling commercially prepared Smear No. 62. Instructions for preparing the smear at home or by your druggist are given below.

SMEAR NO. 62 (FORMULA)

A mixture of Turkey red oil (pH-10 or neutral), Lamp black, Diphenylamine (technical grade) and Benzol (commercial) is used in preparing Smear No. 62. The formula for a typical preparation is:

- Turkey red oil (pH-10 or neutral) — 1 part by weight
- Lamp black — 2 parts by weight
- Diphenylamine (technical grade) — .3% parts by weight
- Benzol (commercial) — 3 1/2 parts by weight

The remedy is relatively inexpensive, very effective and will not harm livestock. In case of serious wounds, the

http://lib.dr.iastate.edu/farmsciencereporter/vola/iss3/1
best policy is to consult your veterinarian. We can't afford in this wartime need for food to take chances on losing our livestock.

CAUTION: Benzol is highly inflammable and should be kept away from lighted cigars, cigarettes and open flames. Under no conditions should the dissolving of diphenylamine in benzol be attempted by heating over an open flame. As benzol is highly volatile the prepared smear should be kept in tight containers in a cool place when not in use. In case the smear becomes too thick for easy application, add and stir in enough more benzol to bring back the original consistency.

Preparation, Treatment

In preparing the smear, first dissolve the diphenylamine in the benzol. Mix the two ingredients and allow them to stand for several hours. After the diphenylamine is dissolved, add the turkey red oil and mix thoroughly. The lamp black is then slowly added and the mixture stirred constantly until it attains a smooth, even texture of about the same consistency as molasses. The smear is then ready to use.

No more than is actually needed should be removed at the time of treatment. The material should be kept in tight containers.

The smear may be applied with a clean swab or applicator, but a clean 1-inch paint brush has been found most satisfactory. In treating infested animals care should be exercised to see that the material is forced into the wound so that it will reach all pockets made by the maggots and cover completely the wound, including clotted blood and other exudate matter around the wound.

Usually the maggots will drop out when dead, but if they are removed by hand, treat the wound again immediately.

It's often desirable to isolate treated animals for a period in a pasture near the farm buildings. The smear kills the maggots quickly, and many of the dead soon drop out carrying some of the smear with them. For this reason, a second treatment should be made in 24 to 36 hours to be sure the surface of the wound is properly coated and to insure against reinfection. Small wounds may require no further attention, but larger wounds sometimes require treatment twice weekly until they are completely healed.

Smear No. 62 may also be used to prevent screwworm or other maggot infestation on small cuts and wounds from various causes. When screwworm infestation is known to be present in a community, losses may be avoided by proper and prompt treatment of all wounds with the smear. The raw tissue and surrounding area should be treated thoroughly.

Life History

The primary screwworm passes through four stages in its life cycle: (1) The egg; (2) maggot or larva; (3) pupal or resting stage, and (4) adult fly. The screwworm is the larval or maggot stage of the screwworm fly. In warm weather the life cycle from egg to adult may be completed in about 3 weeks.

The adult female fly lays the yellowish eggs in shingle-like masses on the dry skin near a wound, blood spot or infected opening. As the eggs are laid, each is coated with a cement-like substance which firmly glues the eggs to each other and the skin. The number of eggs in a mass ranges from about 10 to 400. Abrasions, scratches from fighting, cuts from barbed wire, nails or other causes, such as wounds from castration, docking of lambs, ringing of hogs and bruises, blood spots from tick or insect bites, small or large wounds of any kind attract female flies for egg-laying.

New-born animals and their mothers need special attention to avoid infestation. Eye sores and discharges from nasal passages and mouth wounds also attract the female flies. The eggs hatch in about 10 to 12 hours after they are laid and the tiny maggots immediately bore into the flesh, feeding on the living tissue in clusters and thus form pockets in the wounds. In about a week, the maggots complete their development, stop feeding, drop out of the wounds to the ground, enter the soil for the resting stage of about 2 weeks when they emerge as flies, mate and start laying eggs.

Be specific when assigning work to a person who, though not as familiar with farming as you are, has volunteered to help meet your labor shortage. Show exactly what you want done and how. Demonstrate the task one step at a time, and then observe while the worker tries to do the task.

Cattle and hogs fed out at lighter weights will produce more pork and beef with a given amount of feed.
ONE OF THE newer methods of making hay, chopping it in the field or as it comes from the field and putting it in the barn or stacking it, has gained considerable popularity with some Iowa farmers who feed cattle.

So last year (1941-42) in our feeding tests at the Iowa Station with yearling steers we fed one lot chopped alfalfa hay mixed with the shelled corn. This lot gained best of all those fed and showed the highest margin per steer at the end of the feeding trial.

We wanted a further check on the practice so in the 1942-43 feeding tests, which were completed in June, we compared again a lot fed chopped alfalfa hay, mixed with shelled corn, with another lot which got regular alfalfa hay and shelled corn.

Results Reversed

The results in the 2 years do not agree. This year the lot fed whole alfalfa hay made more economical gains and returned a larger margin per steer over feed cost than the lot fed chopped hay.

The difference may be due to the fact that the hay used in the past year was not chopped so fine; there were more of the longer pieces — 6 inches or more long. So the coming year we plan to chop hay fine for one lot and in longer pieces for another and find out whether or not this may account for the difference in the results of the last two feeding tests.

The steers fed chopped hay last year returned $2.70 per head more margin over feed cost than those fed long hay; this year, the steers fed the long hay were ahead in margin by about $2.85 per head over feed cost. In other words, the results were reversed this year from those of a year ago. We want to find out why.

In the tests this year there were six lots of eight yearling steers each. These were fed for 200 days. Two of

CHOP HAY FOR STEERS?

Results Have Not Agreed in Feeding Trials Past 2 Years at Iowa Station

By C. C. CULBERTSON

The lots were limited in corn to try to find out whether it might be more profitable now to substitute some roughage for a part of the grain. One of the limited grain lots received three-fourths of a full-feed of corn and the other received a half full-feed of corn for the first 120 days and then a full-feed for the rest of the 200 days.

Neither of these limited-grain lots returned as high a margin as the full-fed steers of the other four lots.

The two limited grain lots also received chopped alfalfa hay mixed with their corn. One lot was fed ground corn instead of shelled corn and the sixth lot received a sweetened protein supplement instead of linseed meal.

The lot receiving the sweetened protein sold for 10 cents a hundred higher than the comparative lot on linseed meal, but the margin over feed cost was about $1 per steer lower than the steers on linseed meal.

How They Were Fed

The various lots this year were fed as follows: Lot I, regular alfalfa hay, shelled corn full-fed twice daily, 1 pound of linseed meal per head daily, mineral mixture fed at the rate of 0.75 ounce per steer daily, fed over the shelled corn. Salt was fed free-choice.

Lot II was fed the same except that the hay was chopped, mixed and fed with the corn. Lot III was fed the same as Lot II except that the steers instead of being full-fed shelled corn received three-fourths of a full-feed throughout the 200 days. Lot IV received half a full-feed of corn the first 120 days and was then full-fed the remainder of the feeding period. Lot V was fed the same as Lot I except that corn and cob meal was fed in place of shelled corn. Lot VI was fed the same as Lot I except that a sweetened protein supplement replaced the linseed meal.

The sweetened supplement consisted of 50 pounds linseed meal, 25 pounds soybean oil meal, 10 pounds cottonseed meal and 15 pounds cane molasses. A similar supplement was fed to a group last year, and the results the 2 years are similar — the sweetened protein did not appear to have any advantage over straight linseed meal.

The mineral mixture fed was made up of 60 pounds ground raw limestone; 37.96 pounds special steamed bone meal; 2 pounds iron oxide (ferric); 0.04 pound potassium iodide. The accompanying table shows that the cost of gains was highest in Lot II, which got a full-feed of shelled corn mixed with the chopped hay. This lot

DAILY GAIN, FEED COST, SELLING PRICE, MARGIN, DRESSING PERCENTAGE, SHRINKAGE AND GRADE OF STEERS — 1942-43 FEEDING EXPERIMENT

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<th>Lot No.</th>
<th>I Alfalfa hay — regular</th>
<th>II Alfalfa hay — chopped</th>
<th>III Corn limited entire period</th>
<th>IV Corn limited 120 days</th>
<th>V Corn and cob meal</th>
<th>VI Sweetened protein</th>
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<td>Av. daily gain</td>
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<tr>
<td>Dressing percentage</td>
<td>63.7</td>
<td>64.8</td>
<td>62.6</td>
<td>61.6</td>
<td>62.3</td>
<td>64.7</td>
</tr>
<tr>
<td>Shrinkage (percent)</td>
<td>2.94</td>
<td>4.60</td>
<td>4.71</td>
<td>3.64</td>
<td>3.43</td>
<td>5.77</td>
</tr>
<tr>
<td>Grade of steers in Chicago</td>
<td>6 choice</td>
<td>6 choice</td>
<td>5 choice</td>
<td>1 choice</td>
<td>5 choices</td>
<td>7 choice</td>
</tr>
</tbody>
</table>

http://lib.dr.iastate.edu/farmscienceporter/vol4/iss3/1
also sold slightly highest. In the margin over feed cost the steers of this lot ranked fourth among the six lots. The steers of this lot were able to sort the corn out of the hay to a large extent and leave the long pieces of hay. It cost more in corn to feed this lot than Lot I. The steers returning the highest margin over feed cost were those of Lot I, which got the regular alfalfa hay that had not been chopped and a full-feed of shelled corn. They were followed by the steers of Lot VI getting the sweetened protein supplement. Lot V, with corn and cob meal, ranked a close third.

It did not prove profitable to limit the corn for the steers in this test. In other years with the price ratio different it might pay to limit the grain. Corn was charged at 84 cents a bushel and hay at $12.00 a ton in this experiment.

GROUNDED alfalfa and cracked corn full-fed showed no advantage in rate of gain or in feed saved over whole hay and shelled corn in feeding trials at Iowa State College during the feeding season of 1942-1943.

These experiments also compared the feeding of lambs under shelter to feeding lambs outside with no shelter. Here again no definite advantage could be granted either method.

Small differences in daily gains and in feed consumed showed up, but they were too small to give any definite advantage to any lot. The same is true for the amount of feed necessary to get the gains. Full-feeding ground hay and corn required slightly more feed but very little more. Lambs fed shelled corn and whole hay showed a slightly more desirable finish, but not enough to penalize those self-fed ground feed.

Death losses in both trials were low. From the first double-deck of 310 lambs, only 2 were lost. One was on ground hay and corn and one on whole hay and shelled corn. Both were shelter-fed. Five lambs died out of the second bunch of 300. Three of these were fed inside; one on whole hay, the other two on ground hay. The two lambs lost from those fed outside were both on whole hay. One of all these deaths was from bloat; the rest were from injuries received in shipping or other causes.

Lambs fed outside were handled in a small lot on a sharp south slope. The soil was firm and good drainage kept the lot dry and clean. In cold, windy weather the lambs would bunch up at the lower end of the lot, where they were somewhat protected from the wind by the brow of the hill.

The fleeces of these outside lambs consistently dried out faster after a wet day than those of the lambs given shelter, probably because of greater exposure to the wind. The sheltered lambs had a tendency to stand at the edge of their shed, where the drip from the roof fell directly on them. Roof gutters would prevent much of these wettings.

The favorable season with little wet, cold weather may have had a lot to do with the good results obtained from the outside feeding.

The results of the feeding trial may be summarized as follows:

1. Results from feeding ground hay and corn grain as compared to whole hay and shelled corn show no advantage to either method in rate of gain or in total feed consumed.

2. Lambs fed shelled corn and whole hay had a slightly more desirable finish at the end of the feeding period.

3. Hay and corn must be ground if they are to be full-fed together, or the lambs will pick out the corn, and trouble from over-eating grain may come about.

4. The added expense of grinding hay and corn does not seem to be justified by the daily gains or by feed saved. The chief justification for this practice seems to be its use to hold down death losses when inexperienced help is being used for feeding.

5. Lambs full-fed ground hay and corn started out faster than those hand-fed shelled corn and whole hay, but the latter caught up with the full-fed lambs by the end of the feeding period.

6. In a reasonably favorable year feeder lambs will do as well without shelter as if protected.

When to Plow

Sweet Clover

Some farmers who sow sweet clover with their oats for green manure plow it under in the fall of the year it is sown. To try to find out whether plowing the following spring would increase the benefit from the sweet clover, the Iowa Station tried both systems on two different types of soil — one in Monroe County and the other in Story County.

On the Clarion loam in Story County, it didn’t seem to make much difference in the yield of corn which followed whether the sweet clover was plowed under in the fall or plowed the following spring. In fact, a check set of plots which didn’t have sweet clover sowed on them yielded almost as much as those with sweet clover.

The conclusion from these tests is that the Clarion loam probably had nearly enough nitrogen in the ground so that plowing under sweet clover had little effect on the yield of corn which followed.

But on the Putnam silt loam in Monroe County, plowing under sweet clover in the spring following the year it was sown brought almost double the yield of corn obtained where the sweet clover was plowed under in the fall, and nearly double the yield obtained by plowing under of similar plots in the spring.
NEW BAIT FOR

WORMS, HOPPERS

Sodium Fluosilicate Is Poison to Be Used for Armyworms, Cutworms and Grasshoppers

T HE SAME OLD crop pests—armyworms, cutworms and grasshoppers—are with us in Iowa, though we shall fight them largely with new poisons this year because some of the insecticides we used before the war are no longer available.

Sodium arsenite is the poison we have been using in Iowa for the last 10 years to kill grasshoppers. When our supply of that is used up, then we shall begin using sodium fluosilicate. Preparing baits with this is somewhat different from using sodium arsenite, so we shall discuss the problem here.

Baits poisoned with sodium fluosilicate give excellent kills of armyworms, cutworms and grasshoppers, but are somewhat less toxic to farm and wild animals and not so readily eaten by them as baits containing arsenic. But despite the lesser hazard to man and animals, the same precautions should be taken, for the bait is poisonous.

**BAIT FORMULA NO. 1**

Armyworm, Cutworm and Grasshopper Control

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Small quantity</th>
<th>Larger quantities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat bran</td>
<td>6 lbs.</td>
<td>25 lbs. 100 lbs.</td>
</tr>
<tr>
<td>Sodium fluosilicate*</td>
<td>⅛ lb.</td>
<td>1 lb. 4 lbs.</td>
</tr>
<tr>
<td>Water</td>
<td>about 2 qts.</td>
<td>2½ gal. 9 gal.</td>
</tr>
</tbody>
</table>

*White arsenic (As₂O₃) and paris green are used at the same rate and in the same manner as sodium fluosilicate. Sodium arsenite solution is also poured into the water and used at the rate of 2 quarts per 100 pounds of bran or 2 pints for 25 pounds of bran.

**CAUTION:** After mixing and scattering poisoned bait, thoroughly wash all containers, mixing utensils and hands. Always keep children, dogs and farm animals away from both poison and mixed bait. Pick up and scatter thinly any bait spilled on the ground during the mixing operations. Prepare the bait just prior to application. When broadcast according to the directions, there is absolutely no danger of poisoning birds, wild and farm animals or human beings. Accidental poisoning from baits is due to carelessness which, in turn, may be due to lack of understanding and experience.

Calculate and carefully measure out all materials. Do not prepare more bait than is actually needed for one treatment.

**Preparation**

Spread out the dry bran needed in a tub or other suitable container. Use care to put the sodium fluosilicate powder in the water so as to keep the dust out of the air and thus avoid breathing any of the poison.

Stir thoroughly and keep stirring as about half of the poisoned water is poured slowly over the bran. Then thoroughly mix the bran with a garden hoe. Stir the rest of the water before pouring again and then mix the bait material until each flake of bran has been moistened and coated with the poison. Stirring the water prevents the poison from settling to the bottom of the container.

The finished bait should contain just enough water so that the bran flakes will not adhere to each other when broadcast, but instead will fall to the ground as individual flakes. Broadcast very thinly as a farmer would sow oats from a pail by hand. Five pounds of dry bran will make 10 pounds of poisoned wet bait and is sufficient to poison ½ acre, even in heavy infestations when the “worms” are marching in armylike hordes.

Farmers and gardeners know cutworms that cut off young corn and garden plants near the surface of the ground. The armyworm is a climbing cutworm, and outbreaks usually originate in small grain or grass fields where there is a rank growth of vegetation or the grain has lodged or fallen down. Watching such areas in small grain enables one to poison the caterpillars while they are small and before much damage is done. Small grain fields should be examined about dusk, for the “worms” then become active.

**Baiting the Worms**

Look for signs of their work, such as grain plants stripped of leaves and for “droppings” of the worms on the ground. Also turn over cornstalks or any other debris which caterpillars might be under. Several species of cutworms are usually found feeding along with the armyworms.

Certain cutworms, such as the variegated, often breed up in large numbers in alfalfa and clovers. In alfalfa the
worms usually become numerous about the time of the first cutting for hay. Unless baited then, the new growth is eaten off about as rapidly as it appears and the plants are soon killed.

Do not broadcast bait on windy, cold, cloudy or wet days nor just before a rain. The weather should also be calm, warm and sunny for best results. It is not necessary to add molasses or seasoning material to the bait ingredients for armyworms, cutworms or grasshoppers. As grasshoppers feed mostly in the morning, the wet bait should be broadcast soon after sunrise. Broadcast at the same rate as recommended for armyworms.

**FORMULA NO. 2**
Grasshopper Control: County or Community Mixing Station

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Larger Quantities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Millrun bran</td>
<td>100 pounds</td>
</tr>
<tr>
<td>Sawdust</td>
<td>equal in bulk to 300 pounds of bran</td>
</tr>
<tr>
<td>Sodium fluosilicate</td>
<td>16 pounds</td>
</tr>
<tr>
<td>Water (variable, depending upon condition of sawdust)</td>
<td>20-30 gallons</td>
</tr>
</tbody>
</table>

Makes enough bait to treat 40 acres once.

**Federal, State Help**

We do not advise farmers and growers to prepare dry baits, or to mix large quantities of baits at home. As instructions for handling, storing and mixing sodium fluosilicate dust differ in several respects from those of sodium arsenite solution, detailed instructions for county mixing stations have been sent to all county extension directors. In case of very serious outbreaks, federal and state assistance will be given at county mixing stations.

In all of the feeding tests at the Iowa Station, the Landrace (Danish breed) pigs have averaged 18 pounds more in weight at 180 days of age than the Poland China pigs with which they have been compared.

The average daily gain of the Landrace pigs has been 0.1 pound more per head daily. It has taken 6 pounds more of feed, however, for each 100 pounds of gain in the Landrace breed.

When these differences were examined statistically, it was found that the weight difference was significant and the daily gain nearly so, but that the difference in feed requirement might have been due to chance.

Above: These Decatur County farmers near Leon are using an endgate seeder to scatter poisoned bait for the control of grasshoppers. The same kind of poisoned bait, scattered in the same way, can be used for armyworms, too.

Left: These armyworms, which are a climbing cutworm, are feeding on rye.

Large amounts of the bait ingredients are usually mixed either with shovels or special mixing machines.
DON'T BE AFRAID of a pressure cooker just because you are using it for the first time. It is really very simple to operate, even though it looks very imposing. After a couple of trials with it, you will feel as much at ease with it as with an ordinary saucepan.

Let us try to understand how the pressure cooker operates. In the first place it cooks by a method entirely different from ordinary boiling or steaming.

By means of heavy construction and an airtight seal, steam pressure is maintained within a heavily built kettle. This heavy construction is necessary because the water used in the cooker can increase in volume 1700 times when temperatures above boiling are reached. This fact causes the resulting pressure to be much greater than that outside the kettle.

Because the steam within the pressure cooker has a temperature above the boiling point of water (212°F.), it is capable of killing many bacteria that would not be killed at the boiling temperature of water. Also, this high temperature shortens the cooking time of the food.

Let us examine a pressure cooker. Everything about it is made to take care of increased pressure. Upon the lid are three important parts:

1. A petcock
2. A safety valve
3. A pressure gauge

The Petcock

Before it is used, the petcock should be completely unscrewed. Be sure that you can see light through the opening in the lid where the petcock fits on. The petcock is primarily for exhausting the air at the beginning of the cooking process. The air must be completely exhausted in order that live steam can take its place.

As long as air remains in the cooker the temperature inside will not be as high as that indicated by the pressure gauge. If the steam is allowed to escape for several minutes, then all of the air should be out. This escaping steam may be almost invisible, but it will make a hissing sound.

This is a saucepan type of pressure cooker, designed for meal preparation.

The Safety Valve

The petcock may also be opened gently in case you wish to speed up the drop in pressure. There are really few occasions when you would need to do this.

The safety valve usually consists of a little ball, a shaft and a spring which fits around the shaft. A collar-like covering holds it all in place. This covering contains holes through which the steam issues when the valve "blows" because of excessive pressure inside the cooker.

The ball acts as the closing point and when the pressure is too high, the steam presses it upward against the
spring. If you remove the outer housing of the safety valve and push upward on this little ball, you can tell exactly how the safety valve operates. Sometimes the ball tends to stick because it needs cleaning. It is essential that the ball should move freely. When the safety valve is removed, look through from the underside of the lid and see that the opening is not clogged.

Some pressure cookers have the petcock and safety valve combined in one part.

The Pressure Gauge

If the gauge is correct and all the air has been removed, then the temperatures and pressures within the cooker should be approximately as follows:

- 5 pounds pressure — 228°F.
- 10 pounds pressure — 240°F.
- 15 pounds pressure — 250°F.

Many pressure gauges may be registering improperly especially when they have been used a while. This means that if the gauge should register 15 pounds pressure, the temperature within the cooker may be only 240°F.

Now if a person were canning corn, let us say, at 15 pounds pressure and a faulty gauge were used, it might be the cause of later spoilage.

Pressure gauges can be checked and recalibrated. The Household Equipment Department of Iowa State College maintains such a service.

Excellent cakes have been baked in pressure cookers at Iowa State College.

By HELEN VIRGINIA JOHNSON

The Lid

Proper placement of the lid is important. As a rule it fits in one position only. This position is often indicated by matching arrows on the lid and on the kettle.

If the lid clamps on by means of lugs which screw tight, then opposite lugs should be tightened together. A drop of sewing machine oil on each lug will make the lugs easier to unscrew later.

When you are ready to remove the lid, be sure that you tip it away from yourself. This will allow any remaining steam to escape away from your face.

Cooling

The pressure cooker should be allowed to cool gradually. It should never be cooled by means of cold water or a damp cloth. This is because the pressure cooker is made of such heavy material that a sudden change of temperature might cause it to crack.

Maintaining Pressure

After the desired pressure has been reached the heat under the cooker may be turned down. The fact that you can cook with little heat and in less time makes your fuel cost low with a pressure cooker.

It's important to see that the safety valve is kept clean and is working.

It is quite simple to maintain a low heat on gas. Gas lends itself very readily to maintaining a constant desirable pressure. If electricity is used and there are only three heats on the surface unit, the cooker may have to be removed from the heat occasionally in order to keep the pressure constant. A suitable spot may be found on the coal range and the cooker kept there. It is fairly simple to keep the pressure constant with a kerosene flame.

Performance Questions

When first using a new pressure cooker, sometimes the lid doesn’t fit quite tight. This will cause an escape of steam at the rim of the lid. After using the cooker two or three times this usually stops.

If the spring in the safety valve is weak it will cause the valve to “blow” at a low pressure. A new spring will take care of this.

Sometimes the safety valve may be improperly adjusted and will “blow” at too low a pressure. Also there may be a little water in the vent. This issues forth as steam for a short while.

Loss of liquid from the jars in canning may be a problem. It may be due to one or more of the following factors:

1. Fluxtation of pressure
2. Jars too full
3. Food packed too tightly in the jars
4. Too tight a seal on the jars
5. Too rapid reduction of pressure during cooling.

Care of Cooker

When the pressure cooker is to be put away it should be washed, cleaned with steel wool, if necessary, and dried thoroughly. The gauge on the lid should not be dipped in water. When stored, it would be best to invert the lid and leave it ajar for ventilation. Dropping the lid may nick it or cause the gauge to register improperly. Cast aluminum cracks easily when dropped.

GENERAL PROCEDURE FOR USING A LARGE PRESSURE COOKER

1. Check the gauge (perhaps once a season).
2. Check the safety valve.
3. Check the petcock.
4. Put in the food.
5. Fit the lid onto the cooker.
6. Tighten the lugs by opposite pairs.
7. Check the petcock to see that it is open.
8. Start on high heat on the range.
9. Allow the steam to escape from the cooker a few minutes before closing.
10. Bring the pressure up to that which is desired.
11. Turn down the heat and see that the pressure does not fluctuate.
12. Start counting the processing or cooking time from the time when the desired pressure was reached as indicated by the gauge.
13. When the time is up, turn out the heat and let the pressure drop gradually.
14. When the gauge registers zero, open the petcock.
15. Unfasten the lid and remove it away from your face.

Baking Cake in Cooker

Very nice cakes have been baked in the pressure cooker in the Household Equipment Department of Iowa State College. If you wish to do this, be sure you use a low heat and keep the petcock open. The cake batter is placed in a pan and set up on a rack. There should be no water in the cooker. This method of cake baking costs only a trifle as compared with oven baking. Also, it does not heat up your kitchen.

Pressure Saucepan

Within the last few years a saucepan type of pressure cooker has appeared on the market. It is convenient to handle and simple to operate. These cookers were primarily designed for use in meal preparation. They do not have a gauge but maintain a pressure of 15 pounds.

By means of the pressure saucepan, cooking time and costs can be reduced to a small fraction of what they are by other methods of preparation. The tougher cuts of meat can be quickly prepared in such a cooker. Baked beans can be prepared in 1 hour, after soaking. If you wish to give a delicious flavor to meat such as baked stuffed heart or veal birds, it should be well browned first.

All fresh vegetables can be cooked in the pressure saucepan in less than fifteen minutes. Cooking vegetables in this manner helps preserve vitamin C. However, this is not true if the vegetables become overcooked. Since little water is used there is less mineral loss. The amount of time, recommended for cooking certain vegetables at 15 pounds pressure is given in the accompanying table. This table differs somewhat from the tables that have been distributed with the saucepan type of pressure cooker. The recommendations here are based on tests made with a saucepan cooker over an extensive period of time.

Most vegetables can be easily overcooked in the pressure saucepan. When overcooked they lose in palatability, appearance and vitamins. The color of most vegetables cooked by this method seems to compare favorably with those obtained by other methods of cookery. Peas seem to improve in color. Cauliflower and broccoli, however, become somewhat yellow and develop a strong flavor. In general, strong juiced vegetables are more desirable when cooked in an uncovered kettle.

The pressure saucepan can be cooled quickly in a pan of cold water. In this, it differs from the large pressure cookers. This quick manner of reducing the pressure shortens the total time needed for preparing the food.

Freezing Fruits, Vegetables

By H. H. Plagge

With victory gardens to provide vegetables and small fruits, and a shortage of supplies and equipment for home canning, frozen food lockers may see greatly increased use in the home food preservation program. Frozen foods retain more of their natural flavor and color and as much of their original food value as products preserved by other methods.

Iowa has more frozen food lockers than any other state in the country. With rationing of meat, for which most consumers have used their lockers, lockers may be used more than ever before for storing vegetables and fruits.

From the standpoint of successful freezing, recent experimental work in Iowa has shown that more frozen vegetables spoil in lockers because they do not get hot enough than for any other reason. This fact would indicate that scalding is the most important step in preparing vegetables for the locker.

After the vegetables have been sorted carefully and washed thoroughly, they are ready to scald. The water must be kept boiling — and that means at least 4 gallons of boiling water to a pint of vegetables. Cover the kettle to conserve water and heat, but stir the vegetable once during the scalding period — which varies from 1 minute for peas and baby lima beans to 4 minutes for cut corn. Timing is an important part of the scalding process. Scalding time given on the freezing calendar and bulletin of the Extension Service of Iowa State College has been recommended as a result of experimental work.

Vegetables coated with soil, that has become dried, should be soaked a short time in cold water before they're washed. Spray washing is particularly desirable for removing sand and grit from spinach and other leafy greens. While corn usually is not washed, portions that have been infested by the corn ear worm should be trimmed off, and corn silks may be removed by brushing.

Glass, waxed or tin containers are satisfactory for freezer locker storage, but foods will keep better in glass containers. Three-fourths of an inch of headspace should be left in quart containers and one-half inch in pints to allow for the expansion that accompanies freezing. All vegetables except greens may be packed in a 1½ or 2 percent brine; greens should be packed without brine.

A state law requires that vegetables and fruits be sharp-frozen at temperatures below 0 degrees F. before they are stored in the lockers, where temperatures should not be allowed to rise above 10 degrees. At 0 degrees F. the maximum storage period recommended is a year or more, while the storage period at 10° F. may be only 6 to 8 months.