Calves With No Milk

Dairymen who live in vicinities where there are cheese factories or who sell whole milk to be used in cities, or that is to be condensed or powdered have a problem raising calves.

You just can't do a satisfactory job of raising calves without some milk, but the dairymen at the Iowa Station have demonstrated that you can get along with a minimum of milk by starting the calves in on a gruel made largely of oatmeal when the calves are around 3 weeks old.

If you are confronted with the problem of stretching a skim milk supply, you should find the article in this issue by Drs. Espe and Cannon of interest.

Lights for Layers Coming

The October issue of FARM SCIENCE REPORTER will contain an article on the use of lights for layers— one of the ways we have of getting hens to lay more of their eggs in the fall and early winter instead of so many eggs in the spring and summer and so few the rest of the year.

Many Iowa farms now can provide lights for their flocks because of the addition of electricity through REA.

Battle Those Weeds

In spring time, many a person starts out on an ambitious program of gardening, but wilts in mid-summer just when the weeds are getting tall, thick, hard to pull and are making seed.

If the same spot is being used for garden year after year, keeping the weeds from going to seed is a good way to save yourself a lot of work in coming years, as well as helping out this year.

Weed Spraying Materials

A lot of Iowa farmers have practiced spraying patches of bad weeds in recent years, or have hired someone to spray them. We have been wondering whether or not these chemicals—sodium chlorate and Atletic acid—would be available for use during the war. In this issue Dr. A. L. Bakke answers the question as well as telling you some of the things he has found out about weed spraying in his extensive studies in northwestern Iowa.

THANKS FOR THE "FIRE" PHOTOS

All of the photographs used to illustrate the article in this issue by Harold Beaty and Henry Giese on the fire problem were furnished by the Farmers Mutual Re-Insurance Association, Grinnell, Iowa.
Iowa's 13,000 combines will have to work at least 11 days with no time out this fall in order to get Iowa's soybean crop harvested.

The goal set is for Iowa to produce 84 percent more soybeans for seed this year than last. Indications are that the goal will be passed. And that means there's a "whale of a big" harvesting job ahead.

Even with the smaller crop of 1941, some soybeans never got harvested. There are only a few more combines now and a lot more soybeans. So some pretty careful planning and management must be done to get this crop harvested. Much, of course, depends on the weather.

To look at the situation a bit more in detail—Iowa has about 1 combine for every 15 farms. If we have reached our goal of 1,750,000 acres of soybeans for seed, then the 13,000 combines will have to harvest an average of about 134 acres each. We estimate that means about 11 days of steady work for every machine. If weather interferes, the job will be dragged out.

What can we do about this problem? Well, there is no other really satisfactory method of harvesting soybeans. Cutting with a binder and threshing takes more time, more labor, requires twine and does a less satisfactory job. Conservation of time and labor are essential now. Twine needs to be conserved drastically.

It comes down, then, to a matter of an almost "must" job with combines. And to do it with combines means that there must be far more custom and cooperative use of combines and tractors than ever before. It means that every combine must be in top condition before the harvest begins so that all machines can work steadily. It means, further, that every good day must be utilized as soon as the beans are ready for harvest and storage.

Combines which have been harvesting 30 to 40 acres of soybeans this year must harvest 100 to 150 acres or more if we are to save this crop. An estimate of the 10-hour day capacity of a combine, binder or other "harvester" can be obtained by multiplying the width of the cut in feet by the speed in miles per hour. For instance, a 5-foot combine operated at 3 miles an hour should harvest about 15 acres.
in a 10-hour day. This allows for 17.5 percent loss of actual working time. Under ideal harvesting conditions in large fields this daily capacity may be attained even with a complicated machine like a combine. In small fields and with adverse weather or ground conditions, the daily capacity may be considerably lower.

To get those tractors and combines in tiptop conditions before the harvest begins, all weak or broken parts need to be replaced. Careful adjustment and operation of the combine will keep these at a minimum.

United States Department of Agriculture workers found in 1935 and 1936 in studies in Illinois and Mississippi that harvesting losses ranged from about 9 to 16.5 percent. Split beans varied from about 1.5 percent to nearly 7 percent. Losses in the straw were nearly twice as high in some cases as in others. But the big variation in loss came in the adjustment of the cutter bar, varying there from about 7 to 13.5 percent. The speed of operation in these tests was just under 3 to nearly 4 miles an hour, and it didn't seem to have much effect on the losses.

Of course soybeans aren't the only crop that a lot of Iowa's combines will harvest this year. Harvesting small grain with a combine saves on the average of 3 to 3.5 hours an acre. So many a farm pressed for labor harvested small grain with a combine. If the Iowa farmers carried out their 1942 "Intentions to Plant" program announced in March and if combines did all of the harvesting, each would have about 398 acres of oats and 51 acres of wheat, barley and rye, in addition to their 134 acres of soybeans—a total of 583 acres.

The harvesting job of this season includes some other problems too. They have been able to get as many as 2 acres into the crib per hour. Two good men husking by hand in 70-bushel corn will pick less than a fourth as much as a two-row picker.

And so—the answer to shortage of help in picking corn this fall surely will be the use of mechanical pickers. Theoretically, the capacity of a mechanical cornpicker is limited only by the speed at which it is operated. Actually the amount harvested in a day or hour is limited partly by the skill of the operator, number of interruptions such as clogging, adjustments, turning, changing wagons and the physical endurance of the operator as well as the speed of the machine. Keeping interruptions at a minimum speeds picking.

Corn picking can be speeded up by using two crews, one working
part of the night by using lights on the tractor and lights at the crib. The Iowa Station in a survey found that Iowa has about 12,267 single-row cornpickers and 25,803 two-row pickers. The same survey showed that the one-row pickers harvested an average of 62.2 acres last year and the two-row machines 162.9 acres. This year with the shortage of help, probably a lot of pickers that have been picking only 60 or 70 acres will harvest 400 or 500 acres. In other words, they will be working not alone for the owners but a lot of neighbors.

Exception under favorable conditions for machine-picking, the losses are larger with a cornpicker than by hand picking and they are much larger as the season advances. The Iowa Station workers have found that it is best to start picking with a mechanical picker just as soon as the corn is ready for cribbing. Losses on some varieties of corn were nearly five times as great on Nov. 26 as they were on Oct. 28.

Getting Silos Filled

One job that takes a lot of labor in the fall on many farms is silo filling. Iowa has about 1,269 field ensilage harvesters which cut the corn in the field ready to be blown into the silo. Of the stationary ensilage cutters which operate at the silo (the corn having been cut in the field with binders and hauled to the silo in bundles), Iowa has 12,479.

A study of these two methods by the Minnesota Station showed that the total cost of the labor per acre was less with the field harvester than with the stationary ensilage cutter. Besides, the labor with the field cutter is not nearly so hard, for the only handling of the corn the men do is in unloading the cut corn at the silo into the blower which elevates it into the silo.

So in this season with the need for labor and the necessity in some instances of getting along with less "strong" help, the field ensilage cutters probably should be used to full capacity. They can reasonably be expected to harvest 1 acre an hour.

Here are a few suggestions for increasing the capacity and hourly output of silo filling equipment:

1. Use large trailers pulled by tractors to collect and haul ensilage from the field harvester to the silo.
2. Use low to medium height racks with a large capacity for hauling bundles from the field to stationary choppers at the silo.
3. Attention to the mechanical condition of the stationary ensilage cutter will reduce power requirements and increase capacity. The tips and outer edges of the fan blades should be adjusted or built up to run within 1/4 to 1/8 inch of the blower housing. Cutter knives should be sharpened every half day and the shear bar adjusted as close to the knives as the thickness of a newspaper. The knives should be adjusted or shimmed up to produce a uniform clearance of the shear bar.
4. One man in the silo to distribute the silage is all that is necessary. Tramping in the silo as it is filled is no longer practiced on the majority of Iowa farms. An increased tonnage of silage may be stored by allowing a partially filled silo to settle for several days before completing the filling.

New Haying Practices

Newest among the practices in making hay are baling out of the windrow, the use of tractor sweep rakes and combination sweep rake stackers, storing grasses and legumes as silage and storage of chopped hay.

Our experience here at Iowa State College does not show that all of these newer practices save labor, though they have other advantages. Where bales are picked up and stored by hand following the pick-up baler, the total labor per acre is greater than with the use of a hay loader and hay rack, we have found.

An advantage of the baled hay, however, is that it occupies less than half the storage space required for loose hay.

In the introductory stage now is the field forage harvester. Although one company has been selling a field hay and forage harvester for years, the practice of chopping hay in the field is not widespread. Manufacturers of farm equipment are experimenting with small, light weight, low cost field harvesters or choppers which can be used to chop dry hay or straw from the windrow and to cut and chop green grasses and legumes for silage. From the standpoint of utility, such a machine should also be able to chop corn for silage.

Development and manufacture of new haying equipment undoubtedly will be greatly slowed down by necessity of directing our efforts toward winning the war. Once that job is finished we may see great strides in improving and increasing haying equipment as well as other farm equipment.
GOOD MANY Iowa farmers who have been in the habit of separating their milk on the farm, sending the cream to market and using the skimmilk for raising their calves and pigs have a new problem now. The demand for more cheese, more dried milk and more condensed milk for the army and navy and for our allies in the war has caused many Iowa dairy plants to start turning out these products instead of just butter.

If you happen to be one of those farmers who is confronted with the problem of raising calves now with a reduced supply of milk, you may be interested in some work we carried on here at the Iowa Station to try to find an economical and efficient substitute for milk.

We claim only partial success, because in our opinion no real substitute has ever been found for milk in calf feeding.

This past winter we have been trying out some simple milk supplements. Several kinds were tried, but one gave better results than the others. Because oatmeal is frequently fed to very young children, we used this as the principal ingredient of our successful ration. We then added 1 part linseed oilmeal for each 3 parts oatmeal along with a little salt, bone meal and vitamin supplement.

Here is how we fed these calves. The calves were allowed all the whole milk they needed until 3 weeks of age. This amounted to around 1/2 pound daily for each 10 pounds of live weight. At 3 weeks of age the milk was reduced in amount and used in making a gruel. Enough boiling water was added to the oatmeal, with linseed oilmeal mixed in it, to make a thick paste, stirred and then cooled with 3 pounds of milk. The amount of gruel fed depended on the calf.

By Dwight Espe and C. Y. Cannon

In this experiment 80- to 90-pound calves were fed about a fifth of a pound of the mix (dry basis) twice a day. The milk in the gruel was gradually replaced with water so that the calves were receiving a milk-free gruel at 6 to 8 weeks of age, depending on the vigor of the calves.

A grain mix was accessible to the calves at all times. It consisted of 3 parts ground corn and 1 part wheat bran. They also received all of the best grade of alfalfa hay they would eat.

Gains and Growth

Holstein calves gained 1 pound a day during the 6 weeks of the trial (from the time they were 3 until 9 weeks of age). This is a normal rate of gain for calves of this age. Other breeds did equally as well although, of course, their rates of gain varied with the breed. Although not fat, the calves showed sufficient bloom to indicate a good
These calves got all the whole milk they needed until 3 weeks old and then were shifted gradually to oatmeal gruel. At 6 to 8 weeks they were fed no milk.

healthy condition. Their alertness and activity also indicated plenty of vigor. A normal height at withers for their age was further proof that they had not been stunted by this minimum-milk plan of feeding.

Feeding Suggestions

The gruel method of feeding takes more time and requires more skill than the usual methods of feeding. However, it is the most satisfactory and economical method of rearing calves we have found when milk is scarce. Of course, we're assuming that skim milk, whey, dry skim milk, dry buttermilk and similar milk by-products have become scarce along with whole milk.

Oatmeal gruel as we fed it had two advantages over the other methods which we tried. The pouring of boiling water over the oatmeal mix tends to rupture the starch particles. The heated feed is not only more digestible but the calves like it better. Another advantage of heating is that this oatmeal gruel hardly ever scour calves even though fed in relatively large amounts. Scouring is frequently encountered with calf starters because the finely ground grains tend to escape into the intestine before they have been sufficiently digested.

Although oatmeal is considerably higher in price than ground oats it has several advantages over the unhulled grain. It contains only 2 percent fiber as compared with 10 to 12 percent for whole oats. Since calves have difficulty in handling roughage at this early age, large amounts of fiber are a detri-
WHEN a nation at war is short of labor and building supplies, it's mightily costly to have to take some of that scarce labor and materials to replace essential buildings or materials that have burned.

We know of no concrete evidence to indicate that Iowa and the Midwest in general are going to have a wave of sabotage which will result in burning buildings and fields of crops. We do not anticipate extensive enemy aircraft bombing of the Middlewest. But either or both of these are possibilities. The British dropped white phosphorus fire cards, commonly called "British Calling Cards," on the grain fields of Germany and they caused numerous fires.

It's not likely that "calling cards" will be dropped on our grain fields, but military authorities point out that Oslo, Norway, is 280 miles closer to Minneapolis than Brest, France, is to New York City. The military men say that suicide air raids could be made in the Middlewest. The enemy aviators could drop their bombs and then alight and surrender. Few of our rural fires, however, are likely to be caused by the war.

We have been digging into some of the major causes of fires and methods of preventing them here at the Iowa Station. For this study the Agricultural Engineering Section was given access to the records from the State Fire Marshal's office. The table, top of page 10, shows that in the 10-year period, 1930-39, 61 percent of the total country fire loss was dwellings, 32 percent barns and the other 7 percent was of all other farm buildings.

So if you are going to have a fire, it's most likely to be your house; next in danger is your barn, with the other buildings following.

There is a lot you can do to prevent fires. Three-fourths of the fires of dwellings from known causes are the result of defective flues—holes in chimneys—and sparks alighting on roofs. And the barn fires—70 out of every 100 are caused by spontaneous ignition and lightning. Piling hay in the barn that isn't cured or permitting the roof to get leaky so that cured hay is wet by rains to a dangerous point causes spontaneous ignition. The proper use of lightning rods will prevent fire from lightning. The accompanying tables (bottom of page 10) show the loss of different types of buildings and the causes of fire.

Battle Home Fires

What can we do to prevent the dwelling fires? Here are a few suggestions:

1. Most of the fires in dwellings are caused by faulty flues or heating systems. So, first of all, look at your chimneys. See that they are built on concrete or solid masonry foundations of large enough area to support the weight without settling or cracking. The footing for a chimney on the outside should start below the frost line.

Connection between the chimney and roof ought to be made with metal flashing to allow for settling. Chimneys in frame dwellings should be built from the ground up or rest on building masonry or foundation walls. Chimneys never should rest on wooden floors, beams or brackets.

2. Use mortar containing only

By HAROLD H. BEATY
and HENRY GIESE

This chimney above roof showed nothing to indicate its condition in the attic.

This pipe went through a wooden floor, insulated only by some asbestos paper.
a small percentage of lime in laying or repairing a chimney because the acids formed in the chimney deteriorate lime mortar rapidly so that cracks and holes may develop. Mortar used in chimney construction ought not be leaner than the following mixture: 1 part Portland cement and 3 parts clean sand, by volume, with hydrated lime in the proportion of 9 pounds to each sack of cement.

3. Inspect all chimneys at least once a year, preferably in the fall before the heating season begins. The inspection should be thorough and should include as much of the chimney as can be seen from the cleanout openings in the basement to the top of the chimney above the roof.

Chimneys passing through attics and concealed spaces need to be carefully examined with the aid of a flashlight and a short, stiff wire to be used in testing mortar joints. Pay special attention to the condition of the bricks and mortar near the roofline, both in the attic and above, as deterioration usually starts at this point.

4. Stoves, furnaces and other heating units need to be large enough to keep the home at a proper temperature in coldest weather without crowding or over-heating them.

To avoid excessive sooting where

Uninsulated joints and splices in wiring for electricity are a fire hazard.

... soft coal is used, add fresh coal at one side of the fuel bed rather than over the entire fuel bed. Keep the feed door damper open. A damper in the smoke pipe is open when the ash pit damper is closed, and vice versa. Clean the ash pit daily and the smoke pipes and flues regularly.

5. Make sure that all smoke pipes, cleanout covers and flue stops fit tightly into the chimney. Close all unused flue holes permanently with bricks and mortar and do not paper over tin flue stops. Smoke pipes should not enter a chimney above the second floor.

If necessary for pipes to run through partitions or floors, use ventilating thimbles which will keep the pipes at least 3 inches from the wood. Protect combustible walls with asbestos if smoke pipes are closer than 8 inches. Furnace smoke pipes should clear woodwork by at least 18 inches.

6. Protect floors under stoves with an insulating board covered with sheet metal of not less than 26-gauge. Such protection should project at least 12 inches at all sides of the heating unit.

No woodwork or wooden lath and plaster partition should be permitted within 3 feet of the sides or back of the furnace unless it is covered with a metal shield or other incombustible material to a height of at least 4 feet above the floor. Protect walls and partitions near ranges by an insulating material if roof do not ignite readily. The hazard increases rapidly as they split and warp. Do not expect a roof to last too long. Dipping wood shingles in paint before laying will make them more fire-resistant. When the wood shingles become curled and fuzzy from weathering, they will burn very readily. If the dwelling roof is in this condition it should be replaced, preferably with fire-resistant roofing, or else spark arresters should be installed on all chimneys to prevent large sparks from passing out the chimney and lodging on the roof.

7. Don't use cheap grade wood shingles. Flat-grained shingles will curl badly. Edge-grained cost slightly more but will last much longer. Don't try to cover too much surface with a thousand shingles. Shingles laid 5 inches to the weather do not have sufficient support and will soon work loose. Lay them with an exposure not to exceed 4 1/4 to 4 1/2 inches.

It has been demonstrated that new wood shingles lying flat on a roof do not ignite readily. The hazard increases rapidly as they split and warp. Do not expect a roof to last too long. Dipping wood shingles in paint before laying will make them more fire-resistant.

Check Barn Fires

The two main causes of barn fires are spontaneous ignition...
and failure to install lightning rods or to keep them working. It ought not to be hard for any farmer to watch these two main causes. Here are a few suggestions for preventing barn fires:

1. Be sure your hay is cured and stays dry. If hay can’t be cured property because of frequent rains, stack it in the field rather than place it in the mow. Guard against leaks in the barn roof. Hay that is well cured when stored may ignite spontaneously if it is wet by rain coming through a leaky roof.

2. The lightning conductor or cable must form an unbroken path from all terminals or lightning rods to the ground. The cable should be grounded at least two points as widely spaced as possible. See that the ground cables are down to moist earth or to a depth of 8 or 10 feet, and protect them above ground from getting broken or pulled up by livestock or machinery. The most practical means of protecting a cable is to set a flat wood post close to it. Broken lightning cables may be securely spliced by means of inexpensive copper splicers designed for the purpose.

Liquid carbon dioxide—such as in cylinders at soda fountains —has been found effective in lowering the temperature in heating hay and in displacing oxygen necessary for combustion. Pipes are driven through the hay to the heating area and the gas released through them. The carbon dioxide will act as a cooling agent and may lower the temperature of the hay below the danger point for several hours.

Defective electric wiring, defective oil and gas stoves, careless use and storage of gasoline and kerosene, smoking, lamps and lanterns, bon-fires, rubbish and oil brooder stoves, spontaneous ignition of oily rags or dust, sparks from engines or motors also cause country fires. Most of these hazards can be easily removed.

Using good judgment is all that’s necessary to prevent most fires that are the normal results of carelessness. The following safety rules were formulated by the Fire Inspection Department of the Farmers Mutual Reinsurance Association, Grinnell, Iowa. If you follow these suggestions you will help reduce Iowa’s wartime fires.

**Safety Rules**

1. Place paint and oil rags in closed metal containers.
2. Place oil stoves and lamps well away from drapes, curtains and inflammable matter.
3. Fill fuel tanks in daylight and away from flames.
4. Clean wicks and burners frequently by washing in hot water and lye.
5. Avoid placing stoves and lamps in drafty locations.
6. Don’t use gasoline or kerosene to start or re-ignite fires.
7. Don’t use inflammable liquids for home dry cleaning.
8. Remove all inflammable matter from attics and basements.
9. Keep yards free from rubbish and leaves.
10. Keep ashes in metal containers away from buildings.

In 1940 Iowa had 357 fires in which 77 people died and 366 others were injured. More than a third of these deaths were on farms. In addition, the fires destroyed 200 mules and horses, 531 head of cattle, 1,254 hogs, 439 sheep, 13 dogs, 6,695 head of poultry and 45,361 baby chicks.
Spraying TOUGH Weeds

You Can Control Creeping Jennie and Canada Thistle With Two Sprayings Properly Applied

By A. L. BAKKE

The Cherokee County sprayer at work on field infested with Canada thistles.

Two sprayings with sodium chlorate or Atlacide applied at the right time and in the right manner will whip Canada thistle and European bindweed (creeping Jennie).

The Iowa Station for more than 10 years has been working on the problem of killing these weeds, as well as certain other "tough" ones, in northwestern Iowa. During that period we have tested a good many different methods of control. Spraying has proved successful and practical when the areas of the weeds are not too large.

It is not difficult to apply sodium chlorate or Atlacide. You merely mix 1 pound of either of these chemicals in 1 gallon of water. Then spray the weeds so that all the vegetation is thoroughly wet.

We have found that the success you have in killing the weeds depends a lot on when you apply the spray. To kill European bindweed, spray when the plants are in full bloom, which is usually early July. To kill Canada thistle, spray when the buds are about to appear—in late June or early July. With either thistles or bindweed, a second spray in the fall is often necessary.

In 1934 we demonstrated that one should not cut thistles before spraying. In that year we sprayed some thistles at Hawarden on July 6. They were about 3 feet high and that one spray killed about 90 percent of them. In the same year we applied the same amount of spray on some thistles at Inwood that had been cut the previous day. The Inwood spray killed very few of the thistles. The second spray at Hawarden that year, applied in October, finished the killing job.

We have found that there is no advantage in mixing more than a pound to the gallon of water. If weeds are scattered so that there are only two or three to the square rod, a pretty good way to "finish" them is to use the spot treatment. With this treatment, you don't spray, but instead, apply a small tablespoonful of dry sodium chlorate or Atlacide around the base of each plant at the ground.

A lot of farmers have had poor results in spraying European bindweed in small grain invariably gave good results. Practically all of the patches of bindweed sprayed in small grain were completely cleared out in one season. Two sprays were made, but often there was little to spray the second time. When European bindweed grows in small grain it becomes shaded and the reduction in light causes it to lose its trailing, prostrate form, and instead it becomes a climbing plant. When it twines around and climbs up a plant, the leaves are exposed so that all the plant is easily wet with spray.

Since we know that the bindweed can best be killed when it is growing in the climbing form, such as in small grain, if a patch is found not in small grain, the best procedure is to plow it and seed lightly to millet.

When there is a heavy growth of bindweed, then spray. Thoroughly wet both the millet and bindweed. After spraying do nothing further until and unless the bindweed shows up again, and if new plants do appear, spray again in late September or early October.

If one finds a patch of bindweed in a cornfield and it is too late to seed millet, keep the ground fallow by cultivating with a duckfoot cultivator every tenth day the rest of the summer, and in the fall sow rye or winter wheat. That will give you a chance the following July to give it a good spraying when it is twining up the rye or wheat stalks; if necessary apply a second spray in the fall to finish off the job.

Often one finds bindweed growing along with other weeds—spray when the bindweed is in full bloom and wet everything about it.

There is one thing highly essential for you to keep in mind if you use sodium chlorate for spraying weeds—it is an extreme fire hazard when it becomes mixed with organic matter—and that organic matter can be your clothes.
38,000 pounds) 6½ cents a pound.

The Brady Warehouse of Fort Dodge, Iowa, has a stock of sodium chlorate at the present time.

The Chipman Chemical Company, Bound Brook, N. J., manufactures Atlacide. This company states that reasonable supplies of Atlacide are available through their regular Iowa distributors—McKesson & Robbins at Omaha, Neb., Sioux City, Cedar Rapids, and Burlington; the Des Moines Drug Company, Des Moines; Northwest Distributing Company, Mason City; Overton Chemical Company, Summer, Iowa. On account of differences in freight rates, the prices quoted vary somewhat.

The War Production Board, collaborating with the U. S. D. A., has established allocations of sodium chlorate and chlorate-bearing materials such as Atlacide for each state. They have been rather generous in their allocation for Iowa. For the first 6 months Iowa was to have 514,000 pounds of sodium chlorate. It is expected that the allocation for the second 6 months will approximate these figures. The sale of Atlacide is restricted to noxious weed eradication.

Spraying can be a highly successful way of killing some tough weeds. Of course Atlacide has a lot of sodium chlorate in it and some other material to hold down the fire danger.

The price of sodium chlorate and Atlacide is the same this year as last—7½ cents a pound for 100 to 500 pounds, 7 cents for 600 to 1,900 pounds, 2,000 or more pounds 6½ cents and carload lots (minimum of

A knapsack sprayer is handy for spraying of small areas of weeds.

Best time to kill creeping Jennie with spray is when it's in full bloom as above. Usually a second spraying in the fall is needed to finish the job of killing it. that it's dangerous. In applying spray, you may get your clothes wet and when they dry, after having been saturated with this solution—look out. Smoking or sparks from some metallic friction may set you on fire.

The man applying sodium chlorate spray always should wear rubber boots—doesn't make any difference how hot it is—you'll be much safer with boots on. Water is the best means of putting out a chlorate fire—have a supply of it on hand when you are spraying.

Atlacide is far less dangerous. The State Highway Commission has used 1 to 2 carloads per year for 5 years without an accident.

We have found some other important things about the time of applying these spray solutions in addition to the stage of the plants. When the temperature is extremely high and the humidity low, spraying with chlorate compounds does little good. But no matter how hot the day may be, if the humidity is high enough so that there is a pretty good dew at night, results are consistently good. Bindweed growing in barn yards, feed lots or in pastures where the organic matter and nitrogen contents are high requires a much stronger application of chlorate than plants in the open field, we have found.

We have tried using sodium chlorate and Atlacide dry as well as in spray. It takes a little more of the material dry, but, on the other hand, it is also less dangerous applied dry. Using it dry, it should be applied in September or October. About 5 pounds to the square rod are needed. The material should be spread evenly over the infested area, which is difficult for the average person. A chlorate distributor for this purpose is of great help.

The Masters Planter Co., Chicago, Ill., and the E. S. Gandrud Company, Owatonna, Minn., manufacture machines for this purpose.

Atlacide and sodium chlorate seem to be equally effective, in our experience. Of course Atlacide has a lot of sodium chlorate in it and some other material to hold down the fire danger.
"Enriched" Bread
IS NO FAD!

Nutritionists Have Proved Its Value
As Well As That of Enriched Flour

WHEN the bread plate is passed around the table in Iowa homes, it's eight chances out of ten that the Johnnys and Marys and their fathers and mothers will be taking enriched bread—if it's made of white flour. This conclusion, based on a summary of replies to a questionnaire sent to every county nutrition committee in Iowa, is important in that it indicates an interesting and encouraging trend in the use of enriched bread and flour in Iowa.

Because the Iowa Nutrition Committee recognizes the importance of good health in a nation at war, it has been cooperating fully in fostering the national program for enriched flour and bread and extending its use into every county in the state. Dr. P. Mabel Nelson, head of the Foods and Nutrition Department at Iowa State College, is chairman of the committee. The organization has grown until 90 percent of Iowa's 99 counties have nutrition committees with permanent chairmen and co-chairmen.

For a long time, many consumers and retailers alike had a confused notion of what enriched bread really was and considered it more or less a passing fad. Both needed to be taught that there really was something to this enriched bread and flour story. Now, through the efforts of the extension service and county nutrition committees, they have learned that enriched flour and bread are robbing themselves of necessary vitamins and minerals.

While it is difficult to detect this hidden hunger in people, hundreds of individuals have found that increasing vitamin B₃, for instance, gives them greater buoyancy and strength. Lack of this so-called "morale" vitamin tends to make people forgetful, depressed and irritable.

Of course, nutritionists point out, enriched products are not a cure-all or a medicine. They don't give all the vitamins the body needs, so a balanced diet including milk, eggs, butter, meat, vegetables and fruits must be eaten just as usual. But it is an easy way to take important vitamins into the system.

Because lower income groups usually eat more carbohydrates—such as bread— and cut down on more expensive foods that contain essential vitamins and minerals, enriched bread might well serve as an inexpensive source of vitamin B₃, niacin and iron for them. By aiding all families, particularly those with low incomes, in obtaining important dietary elements, the enriched bread and flour program should lessen malnutrition.

Even though enriched flour and bread do contain supplies of nutrients essential to physical well-being, there should be no fear of getting too many—our problem is to find enough to fill our needs. Other foods, too, contribute to the day's intake of substances contained in enriched flours and breads. Niacin is found in lean beef, liver, chicken and in lesser amounts in milk, kale, green peas, tomato juice and turnip greens. Thiamin or vitamin B₁ is found in whole wheat flour, oatmeal and other whole grain cereals, beans, peas and lean pork. Iron is found in almost all of the above foods.

The bread wrappers we used to see commonly labeled "Enriched with vitamin B₁," or "vitamin D" did not contain bread to conform to the more rigid enriched requirements set up by the government now. A slice of bread now—in order to rate the word enriched—must contain more than vitamin B₁ or D. And the person who eats the fortified bread will not put on any more pounds or have any cause for not liking the product, for there is no difference in taste, texture and caloric value between enriched and plain white bread. However, there is a slight color difference. The vitamins and minerals used in enriching flours cause them to be slightly creamier in color than ordinary flours. Consequently the bread or baked goods will have a slightly creamy look—but this gives assurance of greater food value.

White bread may be enriched...
In fact 98 percent of all flour used in America is white. Whole grain flour always has been a problem child to dealers and homemakers alike who find it difficult to keep, especially in warm weather. Then, too, the baking quality of products decreases with an increase of whole wheat, which calls for a 30 to 60 percent substitution of white flour in baked products.

In spite of extensive advertising and educational campaigns to urge people to eat whole wheat bread, they still don’t consume it in large enough quantities. As a result of this lethargy on the part of consumers, either whole wheat bread and plenty of cooked whole grain cereals must be used or the flour enriched. Even when whole wheat flour is used in bread, the 30 to 60 percent of white flour in the loaf should be enriched.

To accomplish the goal set by the Federal Extension Service that all flour in the United States be enriched by Sept. 1, 1942, requires the effort and awareness of every person. Millers have indicated they are willing to enrich their lower grades of flour if the consumers demand it.

In May, Floyd County, Iowa, cooperated with the Federal government in carrying on one of the four intensive county-wide enriched flour programs in the United States. In the program, all the millers supplying the grocers in the Charles City trade area assured Iowa nutrition specialists they were perfectly willing to enrich the lower-priced flours if the homemakers asked for it. Some brands even came on the market enriched the week the program was in full swing. One grocer reported that his wholesale house had called him the day of the special program in Charles City, telling him that they would collect both of their unenriched brands and return them enriched with the labels indicating the change.

The success of enriched bread and flour is up to the consumers. If they ask for and insist on buying only products which are enriched, retailers will get them.

In several different ways. A high vitamin yeast and plain flour may be used; a powdered synthetic mixture containing thiamin, niacin and iron may be added to the dough, enriched flour may be added, or a combination of different methods may be used. Nearly all enriched white bread is made with milk or milk solids which provide some riboflavin and calcium but does not increase these nutrients to the standards required by the government.

Increasing tendency of enriched bread to conform to the government standards is shown by the fact that from 30 to 40 different kinds of flour on the market are reported enriched, with the price range varying from $1.57 to $2.70 for a 49-pound bag. Most of the nationally advertised brands of flour carried in all of the larger stores have the government’s guarantee that they conform to the fixed standard.

The label on both flour and bread will indicate those brands which are enriched, for the Pure Food and Drug standards state that neither are to be considered enriched unless the label so states. Severe penalties may be imposed on any company whose product carries the enriched label but does not measure up to government standards. The average loaf of the fortified product weighs 20 ounces and costs about 11 cents.

Whole wheat—long heralded as most nutritious for bread products—still occupies its throne—but for a relatively small number of people. Ultimately, the whole enriched bread and flour program falls in the consumers’ laps. It is up to the Johnnys and Marys and their parents all over the country to demand enriched bread.
Old Corn Into Beef

Tests Show That Corn 2, 3 or 4 Years Old Is Good if Properly Supplemented

By C. C. CULBERTSON

WILL OLD CORN—2, 3, 4 years old—produce as good results in fattening steers as the most recent crop of corn?

That question has been pondered by a good many cattle feeders. Some of the feeders have reported that the old corn had not given them as good results as newer. The question is a pretty important one since we are on a program of storing corn for long periods. Eventually it must be used, and the main use is in feeding.

We therefore decided here at the Iowa Station to test this question in our cattle feeding operations of the past year. The answer we have for you is this: If you are feeding something else, such as good leafy, alfalfa hay, along with the old corn to make up for the vitamin A that it has lost through age, you will get as good results as with the most recent crop of corn, quality being on a par.

That answer is based on the results we got with 56 head of yearling steers which were fed for 7 months (210 days). The steers were divided into 7 lots of 8 steers each. Five of the lots were fed and handled exactly the same except that one lot got 1937 corn, another 1938 corn, and the other three had 1939, 1940 and 1941 corn.

The feed consisted of all the shelled corn they would eat, fed twice a day, 1 pound per steer daily of linseed meal, salt self-fed, 4 pounds of alfalfa hay per steer daily (this was fed in two feeds) and 0.75 ounce per steer each day of a mineral mixture.

On this ration the gains of the various lots of steers varied from 1.97 pounds per steer daily to 2.20—so close that the differences may have been due to not getting the steers divided evenly rather than to the difference in the age of the corn.

The margin per steer in the various lots (crediting the feed saved by the hogs) ranged from $21.78 to $30.63. The dressing percentage when they were sold in Chicago was exceedingly close—a range from 62.79 percent to 63.75.

One of the other two lots of steers was used to test the value of feeding chopped hay mixed with the shelled corn and the other to find the value of a sweetened protein supplement. Some feeders had told us they got better results feed-
ing chopped hay and they wanted us to test it out. Likewise, some feeders had thought that it was easier to keep steers on feed with a sweetened protein supplement.

So these lots got 1941 corn and were fed exactly like lot V (the 1941 corn lot) except that one lot instead of getting linseed oilmeal as a protein supplement got a sweetened supplement and the other lot got their hay chopped and mixed with their shelled corn twice a day, instead of being fed whole hay.

Our conclusions from the sweetened supplement was that it had no advantage. The chopped hay lot was the highest lot in dressing percentage of the seven fed and second highest in margin per steer. So if you can put up chopped hay at a lower cost than you can baled or loose, there may be an advantage in using it for fattening steers.

Of course if you are going to chop hay in the field, as we did this, you want to make mighty sure that it is dry enough so that it won’t heat enough to get on fire—or if you are in doubt—stack it out of doors. The man who chops hay in the field and puts it into his haymow is really “playing with fire” if he doesn’t understand the danger that lies there. Some farmers are doing it with success, however.

Going back to our feeding story, we had the corn of these various years tested for vitamin A content and we found that the 1937, 1938 and 1939 corn contained only about half as much vitamin A as the 1941 corn. The 1940 corn had about three-fourths as much as the 1941 corn. After it was 2 years old, it was only about half as well fortified with the essential vitamin as the most recent crop, and from there on no appreciable loss in vitamin occurred.

We believe that unless you feed a good quality, leafy legume hay, not too old—ours was grown in 1941—you may not get as good results feeding old corn. But if you do have such a vitamin A supplement, then you can expect just as good results as with new corn.

If one has hay that has been damaged by rains and is stemy and of poor quality, feeding that kind of hay with old corn may not produce the results which we got in our test.

The mineral supplement which we fed to all lots was made up as follows: Ground, raw limestone, 60 pounds; special steamed bone meal, 37.94 pounds; iron oxide (ferric), 2 pounds; copper sulfate, 0.02 pound; potassium iodide, 0.04 pound; total 100 pounds.

The sweetened protein supplement we used consisted of 50 pounds linseed meal; 25 pounds, expeller process, soybean oilmeal; 10 pounds cottonseed meal; 15 pounds cane molasses.

**Seed Alfalfa in August**

*By H. D. Hughes*

**IOWA** needs a lot more high protein forage feeds in order to produce the milk and other food products for our fighting forces, our allies and our people at home.

The crop in Iowa which provides the most protein per acre is alfalfa. And there is still time to make a seeding that will produce a crop next year.

August long has been recognized as a suitable time to make alfalfa seedings. Of course the success depends on soil moisture, and this year soil moisture conditions are ideal. There is the advantage of getting a crop next year, whereas waiting until next spring to seed means that there won’t be a crop until 1944.

To seed alfalfa at this time of year is not difficult. A good place for a seeding is on a stubble field following a small grain crop. We at the Iowa Station recommend disking the stubble rather than plowing it. By disking, a firm seedbed is obtained and that is important. Plowing is likely to leave the ground too loose.

Two important considerations in August seedings of alfalfa are a firm seedbed and sufficient moisture. Disking will aid in retaining the moisture better than plowing in addition to leaving a firmer seedbed.

Seeding in August should be as near the middle of the month as possible in central Iowa, but seedings made as late as Sept. 1 are likely to succeed. Seedings in northern Iowa should be a few days earlier than in central Iowa and those in southern Iowa may be a few days later.

Important items to consider in making a seeding this August are:

1. Be sure the soil is not acid. Have a sample tested by the county agent or the Soils Section of the Iowa Agricultural Experiment Sta-

tion at Ames.

2. Inoculate the seed.

3. Firm the seedbed surface by rolling with a cultipacker or corrugated roller, broadcast the seed and then roll again. Seeding in this way insures getting the seed in at the best depth and it gives the best seedbed we know how to obtain.

4. Use adapted varieties of seed. Ladak and Cossack have given the largest yields of any varieties we have tried at the Iowa Station. If you don’t use them, make sure that it is northern grown seed.

Following these points, and with cooperation of the weatherman, you should have a good stand of alfalfa.

**Alfalfa and Brome**

One of the questions we have been asked at the Iowa Station is whether or not bromegrass and alfalfa might be seeded this fall and if so in what proportions the seed should be used.

Our experience at the Iowa Station indicates that a seeding of 10 pounds of alfalfa and 8 pounds of bromegrass is about right. This combination makes one of the finest pasture crops we know of. It can be used for hay until the brome gets well established, and even after that if one needs the hay.

Bromegrass has about the same feeding value as timothy, but it makes a much better pasture crop. Bromegrass has the advantage of providing pasture through the hot, dry months of July and August when most bluegrass pastures have dried up. Farmers who have bromegrass pastures have said that they will carry 1½ to 2 times as many head of livestock per acre as bluegrass.

Bromegrass seeded with alfalfa does not become sod-bound as soon as it may if seeded alone.