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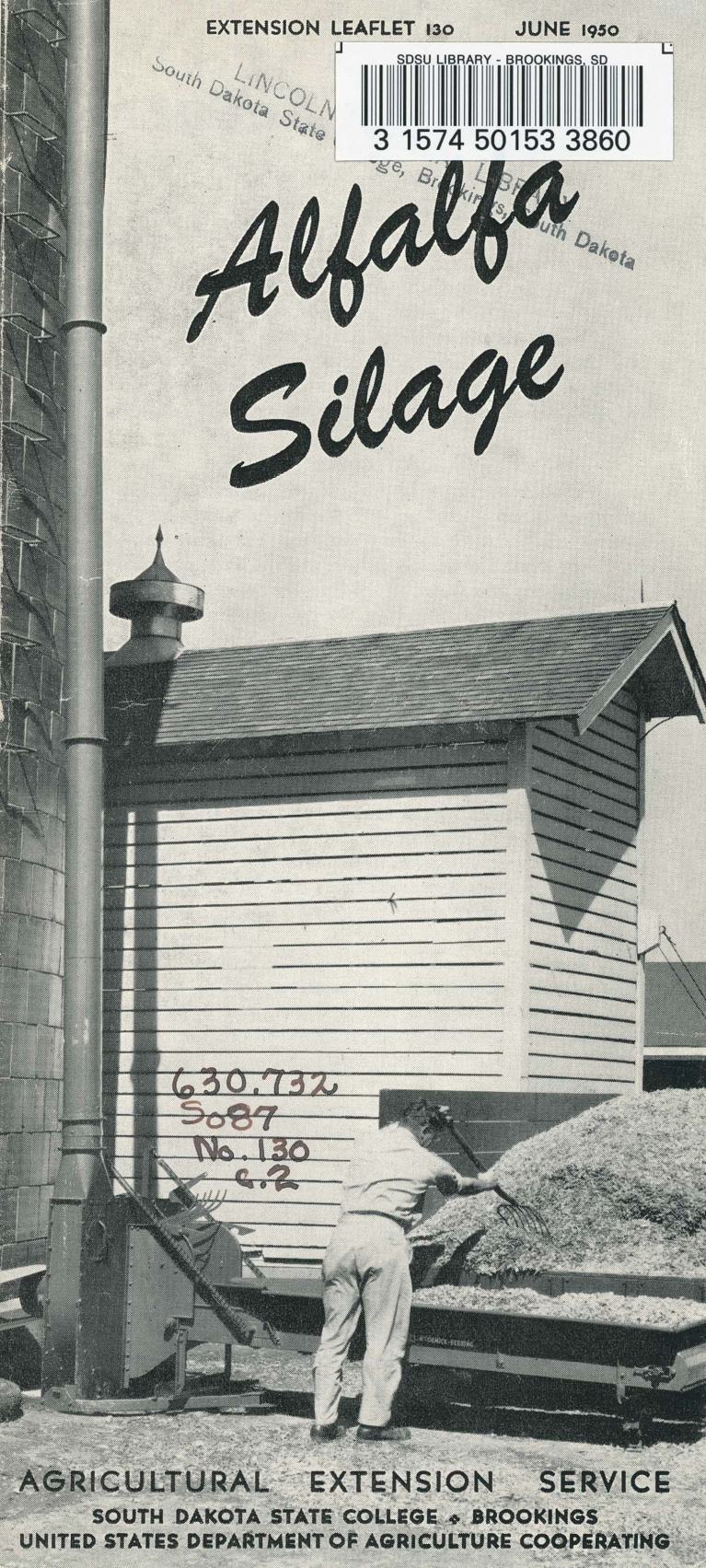
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SOUTH DAKOTA STATE COLLEGE & BROOKINGS

UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING

Alfalfa Silage

By R. A. CAVE and EMERY BARTLE*

Many South Dakota farmers each spring consider ensiling a part or all of their first crop of alfalfa because unfavorable weather often results in poor quality hay.

It is the purpose of this leaflet to give certain precautions and care that must be observed in order to make good alfalfa silage, which are not so important in making corn silage.

Other legumes such as clovers and soybeans, or grasses and mixtures of legumes and grasses, can be made into good silage by following about the same methods used in making alfalfa silage.

Advantages

1. Probably the most important reason for making the first cutting of alfalfa into silage is that it can be harvested in damp, cloudy weather unfit for hay making. Thousands of tons of alfalfa hay were completely ruined in 1948 by wet weather.

2. There is less waste in feeding first crop alfalfa as silage because, when made into hay, the cows will not eat the thick stems and weeds.

3. Even in good weather, from 10 to 30 percent of the food value of alfalfa is lost in the hay making process, while only about 10 percent is lost in making good silage.

4. Much more protein and carotene are saved when alfalfa is made into good silage. (Carotene is the material from which the cows make Vitamin A).

An experiment by the Bureau of Dairy Industry showed that 86 percent of the protein was saved in good alfalfa silage while 68 percent was saved in field cured hay. Fifteen times as much of the carotene was saved as in field cured hay. Part of these increases were due to a greater saving of leaves in the silage.

5. It provides a supply of palatable feed, relished by the cows, which can be used if the pastures dry up.

6. It is cheaper than corn silage and there is less loss of soil fertility, both from the crop and from soil erosion.

7. It can replace corn silage and part of the hay in the dairy cows' ration.

8. Less high protein concentrates are needed in the grain ration than when corn silage is fed.

9. There is less fire hazard than with hay and less chance of a hail damaged crop than with corn.

10. There is a saving in storage space and the silo can be used nearly the year around.

Disadvantages

1. More precautions must be taken and more care used to make good alfalfa silage than corn silage.

2. Unless the moisture is controlled or enough preservative used, there is likely to be a disagreeable penetrating odor from the silage caused by improper fermentation.

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3. If the chopped alfalfa is too wet, it is likely to rot and there will be leakage from the bottom of the silo and a bad odor. If it is too dry it will heat badly and there is likely to be moldy chunks in it.

4. More labor is required in making alfalfa silage than in making hay unless a field chopper is available.

5. There is more pressure from alfalfa silage than from corn silage and some silos may have to have extra hoops up to half the height of the silo.

Time to Harvest the Crop

Probably the **best** stage to cut alfalfa for silage is when it is from **half bloom to full bloom**.

In the bud or early bloom stage, alfalfa will be a little higher in protein and carotene content and a little lower in fiber but will be so high in moisture that it will take a considerable amount of wilting to bring the moisture content down where it will make the best silage. This may be difficult if the weather is unfavorable.

At the Illinois experiment station, alfalfa was harvested for silage from the same field at weekly intervals from May 27 to June 23. The first harvested was before buds appeared; second, early buds; third, 1 to 2 percent in bloom; fourth, 60 to 70 percent in bloom, and on June 23 it was in late bloom. None of the alfalfa was wilted before ensiling.

Unsatisfactory silage was produced in all but one cutting up to June 23 when the silage was rated as very good. This was true in spite of the fact that part of each cutting was ensiled with 50 pounds of molasses per ton. The moisture content varied from 81.4 percent before budding to 70.6 percent in late bloom.

In another year, at the Illinois station, alfalfa cut in late bloom and slightly wilted made excellent silage with and without molasses preservative. The moisture content was 68.2 percent.

Controlling the Moisture Content

The best silage will be produced when the chopped alfalfa has a moisture content of 60 to 70 percent. Poor silage will nearly always result if the moisture content is **below 55** or **above 75 percent**, whether a preservative is used or not.

It is difficult for beginners, in making alfalfa silage, to tell when the moisture content is about right for it to go into the silo.

A rough method for testing the moisture content after the alfalfa is mowed, but before it is chopped, is to tie a few of the stems in a knot and pull it up tight. If the stems do not break, no drops of moisture appear and the leaves show no signs of drying, it is considered about right for ensiling.

When a handful of the freshly chopped alfalfa is squeezed into a ball and then released, it should break apart in several sections. If it falls apart completely, it is too dry for ensiling. If it remains in a ball it is too wet.

Lack of care in testing and controlling the moisture content may result in poor, unpalatable silage.

Use of Preservatives

Preservatives, such as molasses or ground farm grains are recommended, especially for beginners, in making alfalfa silage because they will help in bringing about the right kind of bacterial action and fermentation for good palatable feed.

It is relatively easy to make good corn or cane silage because of the high content of sugar and other fermentable carbohydrates.

Alfalfa and other legumes are high in protein but low in sugar and other carbohydrates. The higher the moisture content the lower is the percentage of these materials which are necessary for good fermentation and high quality, palatable silage.

The most practical preservatives to use on the average farm are cheap molasses, or ground farm grains.

The amount to use depends upon the stage of growth and the moisture content of the alfalfa.

If the alfalfa is one-half to full bloom and is slightly wilted so that the moisture is between 60 and 70 percent, about 50 pounds of molasses or 150 to 200 pounds of corn and cob meal or other ground farm grains will be needed for each ton of the green material. Most of the feeding value of the preservative is retained in the silage.

If the alfalfa is in the bud or early bloom stage and contains more than 70 percent moisture it will take 75 to 80 pounds of molasses or 200 to 250 pounds of the ground farm grains.

Molasses weighs about 12 pounds to the gallon. The method of applying it will be described under "Filling the Silo."

The Wilting Method

Good silage can be made from alfalfa **without adding preservatives if the moisture content is properly controlled.** However, it may not be quite as palatable as when preservatives are added.

The chopped material should not contain more than 68 percent moisture and not less than 60 percent.

The U. S. Bureau of Dairy Industry has been making grass and legume silage, by the wilting method, for many years with consistent success.

The length of time to wilt the crop will depend upon the stage of maturity, the weather and heaviness of stand.

If the alfalfa is in the one-half to full bloom stage it can be ensiled as soon as it is slightly limp which will take not more than an hour on a good drying day.

An immature or heavy crop may require several hours to wilt sufficiently on a good drying day, and a half-day, or more, in cloudy weather.

The mowed alfalfa as well as the chopped material should be checked occasionally for moisture content.

The shorter the time between mowing the crop and filling the silo, the less trouble will be encountered from wet cloudy weather. That is why the half to full bloom stage, which requires little wilting, has an advantage over the bud or early bloom stage.

The Silo

Any well constructed silo with tight doors and tight smooth walls can be used for storing grass silage. Some stave silos may need extra hoops on the lower half to withstand the added pressure.

Trench silos have been used successfully for ensiling alfalfa. Mitchell Bros. of Hecla, S. D., have filled their large trench silo with sweet clover and alfalfa-brome silage the last two years with excellent results.

Snow fence and corn crib silos, lined with paper, are not satisfactory for alfalfa silage as it settles more, tears the paper, and causes spoilage.

Filling the Silo

Very few farmers will make alfalfa silage by hand methods because of the hard, heavy work. With a field forage harvester and other power machinery, however, it takes less time and there is less hard work than in putting it up as hay. Three men—one on the cutter, one at the blower and one to haul the silage, can do the job efficiently if the field is not too far from the silo.

A grain windrower for cutting and windrowing the alfalfa has a distinct advantage over the mower and side delivery rake as it cuts and windrows it in one operation. There is also much less danger of stones being taken up with the forage and damaging the field chopper. Caution must be used not to get the windrows too large for the pickup on the field cutter to handle.

It takes plenty of power to operate the field chopper which should be supplied by a large tractor with power take-off or, still better, an auxiliary motor mounted on the frame of the machine.

The machine cutter-bar should be set to cut one-fourth inch or as fine as possible, so the material will pack well.

The knives must be kept sharp and will usually have to be changed about every half day.

Field cutters can be purchased as separate machines, or a cutting and gathering attachment may be obtained for many makes of field hay choppers.

The cutter should be equipped with an adjustable blower hood which makes it possible for one man to cut and load the ensilage without getting off the tractor seat.

Wagon or truck bodies for hauling the cut material should be equipped with an unloading device.

The blower used for elevating the silage into an upright silo should have a large blower pipe 8 to 10 inches in diameter. This will reduce the chance for plugging, which is a problem with smaller pipes, especially when molasses is used as a preservative.

A silo blower can be made from a stationary ensilage cutter by removing the knives from the fan, or the fan and blower from a grain separator can be converted into a silage blower.

When liquid molasses is used as a preservative, the barrel can be elevated above the blower and the molasses fed by gravity over the crop on the conveyor or in the blower. To avoid plugging, the flow of molasses must be turned off each time

before the blower is stopped and not turned on again until the blower is running.

The amount of molasses applied per ton can be determined by allowing it to run into a pail for one minute. Multiply the weight of molasses in the pail by the number of minutes it takes to run one ton of ensilage through the blower.

There is a lack of agreement in regard to tramping or packing the silage. Some believe it is necessary to tramp it during the entire filling process. Others claim that the high water content and fineness of cut will make the silage pack by its own weight and no tramping is needed. Excellent silage has been made by both methods.

It is a good practice to run a few loads of very wet silage material on top and tramp it around the silo wall several times while it is settling.

Caution must be used not to get too much alfalfa cut and in the windrows ahead of the field cutter as it may get too dry. This prevents packing and causes heating and moldiness.

Alfalfa which has been cut for hay and partially cured, then gets wet, will not make good silage as it will not ferment properly.

Feeding Alfalfa Silage

Alfalfa silage, fed to dairy cattle, can replace corn silage and take the place of part of the hay. It comes the nearest of any feed in duplicating good pasture and makes an excellent summer feed when pastures are short.

Alfalfa silage can be fed as the only roughage, but the cows will be better satisfied if they receive some hay.

When alfalfa silage replaces corn silage less high protein concentrate is needed in the cow's grain ration.

Experiments by the U. S. Bureau of Dairy Industry showed an increase of 12 percent in milk production for legume silage over field-cured hay.

Frozen silage should be allowed to thaw out before feeding.

The disagreeable odor which sometimes develops in alfalfa silage, due to the wrong kind of fermentation, does not seem to bother the cows but it may taint the milk unless the barn is well ventilated.

Good alfalfa silage, fed up to 60 pounds a day, will hold the yellow color of milk produced on good pasture through the winter months.

FOR BEST RESULTS---

- ★ Cut at **Half to Full Bloom**
- ★ Slightly Wilted, Moisture 60-70%
- ★ Add Molasses, Cobmeal, or Ground Grain

AGRICULTURAL EXTENSION SERVICE

George I. Gilbertson, director. South Dakota State College and U. S. Department of Agriculture, cooperating. Acts of Congress, May 8 and June 30, 1914