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How About Oats for Silage?

Oats--a major acreage crop in Minnesota--traditionally have been grown for grain production but have not been a high value crop. Although many farmers recognize this low dollar return, they grow oats as a companion crop for forage seedings to control weeds. Silage made from these oats can supply a lot of feed for Minnesota livestock. Any small grain can be used as pasture, hay, or silage, and all can be managed in the same way as oats.

POINTS TO CONSIDER

Even though oats are well suited as a companion crop, they often cause forage seeding failures. During the seeding year, they compete with the forage crops for moisture and fertility. They also shade the seeding underneath and hinder its rapid establishment.

To improve the establishment of the forage, remove the oats for hay or silage instead of harvesting them for grain. You can usually obtain more vigorous forage stands by removing the companion crop early; in good growing years, you may get one harvest of the underseeded forage in the seeding year.

Early harvest of oats also reduces the possibility of lodging. Lodged small grains smother the forage seeding underneath. Moreover, problems with straw removal and volunteer oats growing in late summer and fall are eliminated by harvesting the oats for silage.

Problems with oat silage

*Many farmers have disappointing results with oat silage because they harvest either too early or too late. Preservation problems then result, causing silage with poor odors, low palatability, and low feeding value. Moisture levels suitable for good preservation can mean the difference between excellent silage and extremely poor silage. The stage of maturity of the crop greatly influences the method of handling the crop and the quality of the silage fed.

*Oat silage is not as high in energy value as corn silage, nor is it as high in protein as good legume silage.

*Harvesting oats as silage rather than as mature grain may leave you without livestock bedding. So plan on some other bedding source.

Advantages of oat silage

*Early removal of oats as silage nearly always gives you a better forage crop.

*Oat silage contains not only the feed value of the grain but also of the stems and leaves. If you make oat silage when the grain is in the late milk or early dough stage, it is worth about twice as much as feed as mature oat grain itself.

VARIETY SELECTION AND SEEDING

Always select varieties with good lodging resistance. Late maturing, tall growing oat varieties are better suited to silage production than early, short varieties. But to avoid excessive competition to underseeded forages, harvest tall, late varieties early as silage. Although short season varieties offer less competition to underseeded forages than do late varieties, forage establishment is improved if you also remove them early.

Seed oats alone at 2 or more bushels per acre. As a companion crop, oats can be seeded as low as $1\frac{1}{2}$ to 2 bushels per acre. However, research in Illinois showed an advantage to seeding late oat varieties at rates up to 5 bushels per acre, applying 100 pounds of nitrogen, and harvesting for silage in the boot stage. Good alfalfa stands were obtained because of early harvest. A heavy seeding rate makes early harvest imperative. If you grow oats for silage without a forage seeding, removal in the boot stage is not so important.

You also can make silage from a mixture of oats and peas; the silage will be higher in protein than oats alone. These mixtures do best in northern Minnesota where temperatures are cool and moisture is high. Do not use the mixture as a companion crop. Mix the oats and peas well before drilling. You can seed them in two operations, but follow the first seeding immediately with the second to avoid injury to germinating seedlings. Always inoculate peas.

FERTILIZING

When using oats as silage, you can increase yields by applying nitrogen. Base your fertilizer applications on a soil test. Because of early removal, lodging is not a major problem; therefore, you can use heavier than normal nitrogen rates.

If legumes are underseeded, apply enough phosphate and potash to correct soil deficiencies. Reduce nitrogen rates from levels used for oats alone.

YIELDS

Yields of oat silage vary depending on weather, varieties, time of planting, growth stage at harvest, and soil fertility. With high fertility and favorable weather, silage yields of 10 tons or more per acre are not unusual.

A general rule for estimating yields is: for every 7 to 8 bushels of grain the field would have produced, it will produce about 1 ton of silage with good fertility. For example, a field capable of producing 70 bushels of oats would yield approximately 10 tons of silage. Use this rule to estimate the number of acres needed to fill your silo.

On a dry matter basis, the protein content of oat silage normally varies from 16 percent at the boot stage to 6 percent at the dough stage. If you harvest oat and pea silage when oats are in the dough stage, the protein content ranges up to about 16 percent. Peas contribute little to total yield but do affect protein levels. As the oat crop approaches maturity, the protein level decreases.

HARVESTING

Time of cutting

During hot dry weather, oats pass from early milk stage to late dough stage in a few days. The time for harvest under these conditions is extremely short. You can cut oats for silage at several different times. But you must change your methods of handling the crop as maturity advances and plant moisture levels change.

1. Early cut before or at early flowering--Oats at this stage are high in protein, low in fiber, and very high in moisture. Wilt to less than 70 percent moisture or add preservatives. The resulting silage should be high in protein but low in energy; it must be supplemented with grain or other energy feed. If you preserve it with ground grain (150 pounds per ton), corn and cob meal (200 pounds per ton), or molasses (80 pounds per ton), you can lower supplement levels.

2. Grain at the top of the head in late milk or early dough stage--Oats at this stage are not as high in protein but are higher in fiber and lower in moisture than early cut oats. Because moisture may still be too high for conventional silos, wilt to less than 70 percent or add preservatives (about 75 percent of amounts used for early cut oats).

3. Grain at the top of heads in middough stage--Oats at this stage are relatively high in fiber, low in protein, and high in energy value. Top oat grains are well into the dough stage and the field is turning yellow. Direct cutting is possible because of natural drying. No preservatives are needed; yields per acre of dry matter are high.

Harvesting at stage No. 1 or No. 2 may be advisable when the weather is unusually dry, lodging has occurred, a higher protein silage is desired, or oats are badly infected with rust.

Filling the silo

Depending upon the size of the field, start cutting earlier than the stage of growth desired in order to achieve a desirable average growth stage for the entire field. Chop the crop short for ease in packing. You can use any type silo--upright, bunker, or trench. Pack well to eliminate air quickly and use a cover of plastic, sawdust, or wet weeds.

You don't need to add extra reinforcements on the silo if you cut the oats at the middough stage. But extra reinforcement may be necessary with early direct-cut oat silage.

Changes in composition of oat forage from boot stage to maturity, St. Paul

Stage of maturity	Moisture at harvest	Protein	Dry matter per acre
	- - - - percent - - - -		tons
Boot	86.5	16.99	1.08
Head	82.7	14.59	1.52
Flower	78.1	11.63	1.91
Milk	72.3	12.28	2.16
Dough	67.1	8.42	2.88
Seed	58.6	8.06	2.62

TIPS ON OATS FOR SILAGE

*Grow late maturing varieties.

*Grow oats with peas for increased protein.

*Inoculate peas.

*Maintain high fertility.

*Cut oats in late milk to middough stage for best yield.

*Wilt oats when cut early, direct cut in middough stage.

*Chop short.

*Pack well; cover silo.

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