



Winter 2003-2004, No. 7

SILAGE PRODUCTION AND FERTILIZATION BASICS

The number of animals in feeding operations such as dairies and feedlots has increased in some parts of the Great Plains over the past few years. With these changes has come more interest in forage production and conservation. The area devoted to the production of crops for silage has significantly increased in some regions, particularly where dairy cattle numbers have risen. **Ensilage is a process of preserving forage for later use as animal feed.** Silage can be defined as any plant material that has undergone fermentation or “pickling” in a silo or storage system in which green, moist forage is preserved.

There are several advantages and disadvantages of silage compared to hay and other forage conservation systems. The advantages include less field and harvest losses, many crop options, mechanization of harvesting, storage and feeding, less likelihood of weather damage during harvesting, and relatively low loss of nutrients with proper ensilage. Silage can be used in many livestock feeding programs. The disadvantages of silage include: bulkiness in handling and storage; it requires additional equipment and structures for harvesting, storing, and feeding; there is high potential for loss if not stored properly; silage is not readily marketable off-farm; and silage must be fed soon after removal from the silo to minimize spoilage.

The major factors affecting silage quality are the type of crop, stage of maturity, moisture content, and length of chop. Within forage species, the stage of maturity has the greatest effect on quality. The optimal moisture content depends on the crop and type of silo used, but is generally around 65 to 70%. Material ensiled below 50% moisture is usually called haylage. Length of chop is a factor since it affects air exclusion in the silo. Fine chopping and packing help assure proper fermentation. **Many crops, including grasses and legumes, can be preserved through ensilage.** The most common and perhaps the best adapted is corn. It is high energy and results in good animal performance. Sorghum (grain and forage) is a popular silage crop in some areas. Alfalfa is also used for silage, but the process of ensilage is somewhat more difficult than with other common crops.

As in hay production, the harvest of a crop for silage results in the export of large quantities of nutrients from a field... essentially all that the plant has taken up. For example, a 30 ton harvest of corn silage will remove about 250 pounds of nitrogen, 110 pounds of P_2O_5 , and 250 pounds of K_2O . This is one of the most important points to keep in mind when designing fertility programs for silage crops.

Nitrogen fertilization can affect fermentation of some crops by decreasing the concentration of soluble carbohydrates required to make high quality silage. This is particularly true with cool season grasses since they tend to be relatively low in available carbohydrates to begin with. On the other hand, corn is relatively high in soluble carbohydrates, so nitrogen fertilization is not a concern from this standpoint.

Phosphorus and potassium fertilization of crops for silage should be based on soil test information and experience. Nutrient removal data should also be considered. Soil levels of phosphorus and potassium can be rapidly depleted if adequate amounts of these nutrients are not applied.

There are many excellent sources of information on the topic of fertilization and ensiling of forages. Numerous texts are available, including a practical book titled *Southern Forages* (available through the Potash & Phosphate Institute; check the website: >www.ppi-ppic.org<). Other good sources include land grant universities and local county extension offices.

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Note: *Agri-Briefs* are available online at the PPI website: ppi-ppic.org/agri-briefs