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Commercial silage additive trials (1981)

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Commercial Silage Additive Trials[1]

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Introduction

Most Kansas grown crops can be harvested, stored, and fed as silage. A good silage fermentation should produce a well-preserved, palatable feed with minimum nutrient loss, but making a good silage requires good management. The crop must be harvested at the proper maturity and moisture, be finely chopped, and be tightly packed in the silo.

Numerous commercial silage additives, whose manufacturers make various claims for improving silage quality, are available. Last year, we reported on 5 trials involving six commercial additives (Report of Progress 377). Each additive improved the silage in at least one of the four criteria we evaluate.

1) Ensiling temperature: Silage heats initially because oxygen is present and, later, as carbohydrates are converted to acids, carbon dioxide, and water. Protein may be heat-damaged. Low temperatures indicate air was removed and fermentation was sufficient to minimize nutrient loss.

2) Silage dry matter recovery: Some dry matter is always lost during fermentation. But good management limits this loss. "Runoff" and silage discarded due to spoilage may lead to poor dry matter recovery.

3) Silage feeding value: This is measured by feeding and metabolism trials, and takes into account palatability and digestibility as well as rate of gain and feed efficiency.

4) Aerobic stability: As silage is removed from the silo, it is exposed to air, and an "aerobic" deterioration can start, causing heating and nutrient losses. Most silages have an adequate "bunk life", but a few may begin to heat and lose nutritive value almost as soon as they are taken from the silo.

We believe our results are useful to farmers who are trying to answer two important questions about any particular silage additive: (1) Will it improve the silage? and (2) Will its benefits offset its costs?

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[1]Mention of products and companies is made with the understanding that no discrimination or endorsement is intended. Also, no criticism is implied of products and companies not mentioned.

Silage additives were evaluated in four of the five silage trials reported here. We used the four most common silage crops in Kansas: corn, sorghum, alfalfa, and wheat. All of the commercial additives (Cold-flo^{R}, Ensila Plus^{R}, Sila-bac^{R}, and Silo Guard^{R}) were used in previous trials at the Beef Research Unit.

Summary

In general, we obtained less improvement from silage additives this year than last.

Cold-flo increased ensiling temperature in corn silage, but lowered it in sorghum silage. DM recovery averaged 5.4% lower for Cold-flo silages than controls and 68% of the nitrogen applied to the fresh crop was recovered in the treated silages. Feeding value of Cold-flo silages was similar to control silages, and Cold-flo extended bunk life.

Ensila Plus lowered ensiling temperatures and improved DM recoveries slightly (0.81% in corn silage and 1.8% in wheat silage), but it did not affect feeding values or extend bunk life.

Sila-bac lowered the ensiling temperatures of forage sorghum silage but not alfalfa silage. Feeding values of both silages were improved by Sila-bac but DM recoveries from the concrete stave silos were not improved by Sila-bac. Control and Sila-bac silages had relatively long bunk lives.

Silo Guard lowered ensiling temperature, increased DM recovery (86.1 vs. 82.0%), and slightly improved feeding value of alfalfa silage.

Summarized in Table 1 are dry matter recovery for 16 additive silages and their nine controls in trials conducted from 1975 to 1980. Recovery of feedable dry matter averaged 85.5% for controls and 89.0% for additives. Twelve additive silages had higher DM recoveries and only four silages, the same or lower recoveries than controls.

Table 20.1. Dry matter recovery for control and additive silages in 9 trials conducted from 1975 to 1980.*

Silage and dry matter	Additive treatment	Recovery of feedable DM**	Silage and dry matter	Additive treatment	Recovery of feedable DM**
		%			%
Corn (38%)	control	80.9	Sorghum (29%)	control	84.1
	Silo Best^{R}	87.5		Silo Guard	92.0
Corn (35%)	control	87.4	Sorghum (33%)	control	91.0
	Silo Guard^{R}	93.7		Cold-flo	84.9
				Sila-bac	90.7
Corn (44%)	control	88.7	Alfalfa (36%)	control	84.6
	Cold-flo^{R}	91.5		Ensila Plus	90.0
	Sila-bac^{R}	91.7		Silo Guard$_{R}$	89.7
	Silo Best	91.3		Sila-lator^{R}	90.4
Corn (37%)	control	93.3	Alfalfa (33%)	control	82.0
	Cold-flo	88.5		Sila-bac	82.0
	Ensila Plus^{R}	94.1		Silo Guard	86.2
Wheat (42%)	control	77.6	9-Trial average	control	85.5
	Ensila Plus	79.4		additive	89.0

*All silages were made in 10 ft. x 50 ft. concrete stave silos.

**Percent of the dry matter ensiled.