

Adding Organic Acids to High Moisture Corn

by Patrick Hoffman and Irv Possin

Introduction

In situations where fermentation of high moisture corn (HMC) is in jeopardy, treatment with organic acids can prevent heating and mold growth. Organic acids can also be used to preserve HMC when adequate storage space is not available. Animals fed HMC treated with organic acids perform similar to animals fed untreated HMC.

When should high moisture corn be treated with organic acids?

If high moisture corn is harvested and stored under recommended conditions, there is no need to treat with organic acids. If, however, conditions exist that jeopardize HMC fermentation, use of organic acids is highly recommended. Fermentation of HMC can be poor for several reasons including:

- moisture content of corn is too low (<26%)
- corn is put into a poor storage unit
- feed removal from storage unit is too slow
- there is a history of chronic heating or molding
- HMC is moved to another storage structure.

What kind of organic acid should be used?

Organic acids come in two basic forms: pure acid or buffered acids. Pure acids include propionic acid, acetic acid, citric acid, and benzoic acid. Buffered organic acids include calcium and sodium salts of propionic, acetic, citric, and benzoic acids. Organic acids can also be buffered with ammonia, resulting in the ammonium salts of propionic and acetic acids. Buffered organic acids come in dry or liquid formulations. Buffered organic acids are safer to handle and less caustic to machinery. When choosing an organic acid, select a product that is

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predominately made up of propionic acid and has a high percent of active ingredient. In general, liquid products are preferred because they can be applied more evenly.

What organic acid application rate should be used?

There are two philosophies of organic acid application for HMC preservation. The first philosophy is that of full preservation. To effectively preserve HMC for one year, 10 to 20 lbs (active ingredient) of organic acids are required per ton of HMC.

A second philosophy is to apply organic acids at low rates of 2 to 5 lbs (active ingredient) per ton of HMC. These low application rates of organic acids are intended to aid in aerobic stability of HMC at feedout. The theory of this practice is to control yeast populations at feedout time. Normal HMC fermentation results in the production of lactic acid. At feedout, some yeast species can assimilate (eat) lactic acid and cause HMC to heat and mold. Yeast cannot assimilate propionic acid. Therefore, low application rates of propionic acid stabilize HMC at feedout by controlling buildup of yeast populations. It should be remembered, however, that low application rates of organic acids do not provide full preservation and high quality HMC is still dependent on normal fermentation. Therefore, when using low organic acid rates, it is advised to use an inoculant (specifically developed for HMC) at ensiling time to help insure adequate fermentation of the HMC.

Does organic acid treated corn affect animal performance?

Studies comparing normally fermented HMC to organic acid treated HMC show no differences in palatability, intake, or animal performance.

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