



## PRODUCTION

# Hay Preservatives - FAQs

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### What are Hay Preservatives?

Hay preservatives are products that allow hay to be baled at higher moisture levels thereby reducing drying times. There are three types of preservative: organic acids, bacterial inoculants and anhydrous ammonia.

### How do preservatives work?

Preservatives work to limit the growth of moulds in the forage through different mechanisms.

**Organic acids:** When applied, organic acids produce an acidic environment (low pH) that is not conducive for mould or bacterial growth. Generally, low pH does not affect hay intake. The two main types of acids that are used as preservatives are propionic and acetic acid. Propionic acid is more effective at controlling mould and bacterial growth and is more commonly. Combining the two acids has proven to be quite effective. These acids can be corrosive to the haying equipment if used in their pure form. Buffered acids are less corrosive.

**Anhydrous ammonia:** Anhydrous ammonia is more commonly used to improve the feeding value of straw and chaff. It can also be applied to high quality forages to prevent heating and spoilage, when baled at high moisture content. Anhydrous ammonia binds to moisture, reducing the availability to mould and bacteria. It also reduces the number of mould forming bacteria through sterilization. However, anhydrous ammonia can create a toxic compound if it's applied to high quality forage such as alfalfa. Bales that have been treated with anhydrous ammonia should not be stored for long periods. It is recommended that the hay be used within one to two months.

**Bacterial inoculants:** Bacterial inoculants are similar to silage inoculants. Most contain lactic acid forming bacteria that compete with mould forming organisms and help maintain forage quality. Some inoculants contain combinations of bacteria and enzymes. The role of the enzyme is to break down plant cells, making more cellulose and starch available to the lactic acid forming bacteria.

### Will preservatives increase the quality of the hay?

The role of forage preservatives is to reduce losses due to moulds and heating. As a rule, preservatives will not increase forage quality. Once quality deteriorates, adding a preservative will not enhance the quality.

Non-protein nitrogen, such as anhydrous ammonia, can slightly increase the crude protein levels in the hay. Some of the ammonia will bind with plant material and increase the overall protein content of the feed.

Preservatives allow forages to be baled at higher moisture content, and reduces the time required for the forage to dry. There should be less leaf shatter and potentially better quality forage when baling at higher moisture content. However, it is still imperative that proper hay making procedures be followed when harvesting and baling.

### When do I need to use a preservative?

Preservatives are most effective when the moisture content of the hay is between 20 and 30

per cent. Preservatives are not effective, if the moisture content is greater than 30 per cent. The amount of preservative needed will depend on the moisture content of the forage in the swath.

**How do I know what preservative will work the best for me?**

<b>Preservative</b>	<b>Mode of action</b>	<b>Application Method</b>	<b>Moisture Content of Hay</b>	<b>Pros &amp; Cons</b>
Propionic acid	Controls mould and bacterial growth by altering pH.	Liquid - Added before swaths are baled.	Up to 30%	- Can be stored - Corrosive
Acetic acid	Controls mould and bacterial growth by altering pH.	Liquid - Added before swaths are baled.	Up to 30 %	- Can be stored - Corrosive - Not as effective as Propionic
Buffered Acid (ie: Ammonium propionate)	Controls mould and bacterial growth.	Liquid added before swaths are baled.	Up to 30%	- Not as corrosive as concentrated acids - Not as effective as concentrated acids
Bacterial Inoculants	Competes with other microorganisms in the hay	Liquid added before swaths are baled	Up to 23%	- Can't be stored - Designed for silage production (aerobic condition with moisture content of 45% or more)
Anhydrous Ammonia	Binds to moisture in hay making it unavailable to bacteria.	Injected into bale or released into covered bale stack.	Up to 30%	- Increases CP - Can't be used on all hay crops - Can't store treated hay for long periods

**For more information, contact:**

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