

Early Season Nitrogen For Grass-Clover Pastures

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Grass/clover pastures that rely on clover to supply enough nitrogen for pasture growth are often nitrogen deficient in the spring. This is because the biological processes (fixation and mineralization) that provide nitrogen to support pasture growth are temperature dependent. So grazing in the spring must be delayed until air and soil temperatures increase to the minimal levels needed to provide enough nitrogen for plant growth.

Nitrogen fertilization of grass/clover pastures in the spring can increase early season pasture yields and decrease differences in seasonal production. But applying too much nitrogen fertilizer will decrease the clover portion of the pasture and decrease nitrogen fixation by the clover. This causes the clover portion of the pasture to become too low to make a significant contribution to the nutrition to the grazing animal and too low to provide sufficient nitrogen for pasture growth later in the growing season.

The reason for the decreased clover portion is the increased competition for light brought on by the increased growth of the grass. To find out the best spring nitrogen fertilization rate for grass/clover pastures for the Northeast, the USDA/Agricultural Research Service ran a study measuring the effect of nitrogen fertilization and grazing height on spring yield of a grass/clover pasture.

The study was conducted for three years at the Penn State Research Farm on an orchardgrass/white clover pasture. The treatments were four rates of nitrogen (0, 20, 40, and 80 pounds per acre) and three grazing heights (6, 9, and 12 inches). Nitrogen fertilizer was applied in middle to late March just as the grass began to grow.

The individual grazing height treatments were harvested whenever the pasture growth reached the desired grazing height.

The goal of early season nitrogen fertilization of grass/clover pastures is to increase early season yields, without decreasing the clover portion of the pasture.

The results of the study show that early season pasture yield can be increased by about 20 percent and the amount of clover in the pasture can be maintained by applying 40 pounds of nitrogen per acre and grazing whenever the pasture height reaches 6 inches. The 80 pounds per acre nitrogen rate and 9- and 12-inch grazing heights increased pasture yields but decreased the amount of clover in the pasture. The 20 pounds per acre nitrogen rate was not enough to significantly increase pasture yield.

In addition to increasing early season pasture yield applying 40 pounds of nitrogen per acre to selected grass/clover paddocks within a grazing system would help set up a grazing schedule that would better distribute pasture production over the whole grazing season. However, the benefits to a particular farm of early season nitrogen fertilization of grass/clover pastures have to be evaluated with regard to the forage needs of the farm. The amount and quality of farm-stored forages, the price and quality of off-farm forages, and the cost of fertilizer nitrogen are a few of the factors that need to be evaluated when considering early season nitrogen fertilization of grass/clover pastures.

Bill Stout, author of this article, passed away on March 1. Bill was one of the original founding fathers of Project Grass and a Project Grass adviser. Bill gave time and advice to the grazing movement for more than 22 years, and received this year's PFGC Research/Extension Award.

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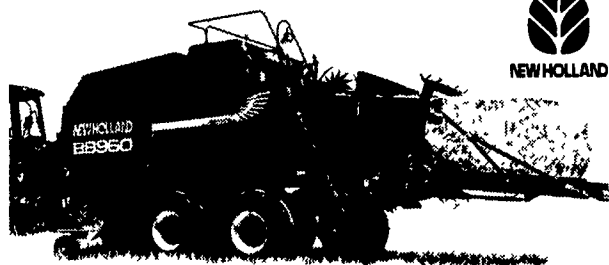
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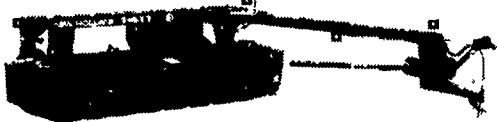
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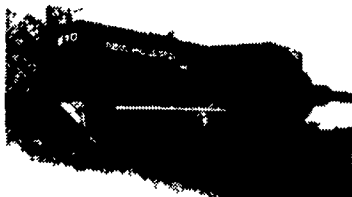
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