Reduced inputs critical to silage production systems

Silage systems are a staple for providing large quantities of highly nutritious feed for dairy cattle in the region.

Unfortunately, these systems require large amounts of inputs to be productive enough to meet the demands of the large numbers of cows that exist in our area.

In a world of fluctuating and often high farm costs, it is imperative that total on-farm inputs be reduced in order to ensure agricultural sustainability and profitability.

For example, plant populations — the number of plants per acre — and nitrogen fertilizers need to be reduced as much as possible so waste is minimized and resource use efficiency is maximized.

Reducing plant populations and nitrogen fertilizer will help lower costs. But it is uncertain how this may affect yield and nutritive value of forage sorghum and corn when grown in limited irrigation situations.

Regional observations have indicated when irrigation is limited, cutting back on seed inputs, such as corn, is beneficial and really necessary to achieve adequate yield and avoid crop disaster. However, little research in this area has been conducted to get a feel for how much, if at all, these systems are affected by the cutbacks.

Research is especially limited on forage sorghum crops.

To help gain some answers to this question, a two-year study was conducted at New Mexico State University's Agricultural Science Center at Clovis investigating the effects of reducing planting rates and nitrogen rates by 25 percent from commonly used quantities.

Crops used were corn and conventional and brown midrib (BMR) forage sorghum.

Seeding rates were reduced 10 and 25 percent from the "standard' rates of 30,000 and 100,000 plants per acre for corn and forage sorghum, respectively.

Corn and conventional forage sorghum were fertilized with 195 pounds and 260 pounds of nitrogen per acre; and BMR forage sorghum was fertilized with 95 pounds and 125 pounds of nitrogen. Irrigation was restricted to 18 inches or less for the growing season.

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Results of the research indicate that regardless of nitrogen rate, planting rate had no negative effect on yield or nutritive value, implying seed inputs can be reduced as much as 25 percent without detriment to these silage crops.

In addition, producing high yielding forage — more than 25 tons per acre — but with lower amounts of water and nitrogen than fully-irrigated corn grown traditionally in this environment is possible.

Common recommendations of inputs should be altered to fit into limited irrigation situations so silage feeding systems are more sustainable and profitable.

High planting rates do not necessarily contribute to increased yields or feed quality and may even result in low quality when other inputs such as nitrogen and water are limiting. Even lower amounts of inputs are currently being studied to develop silage crop response curves to these inputs, which will help in assessing optimum input levels.

It is important to note, even when corn was irrigated with an amount of water considered limiting, it exhibited yields and forage quality characteristics similar to or superior to both forage sorghums: lower fiber and higher net energy. Further indications from this study: While corn and conventional forage sorghum may produce similar yields under restricted irrigation, corn's competitiveness with forage sorghum is dependent upon in-season precipitation in this environment.

High yields of corn were likely due to above average rainfall during the two years.

Much speculation exists about the suitability of corn yield and nutritive value compared to forage sorghum in limited water situations. Previous research at this location has shown there is a tradeoff in yield and nutritive value between forage sorghum and corn when precipitation was below average.

Producers must assess the risk of annual variation and need for either a high yielding, lower quality forage sorghum or a lower yielding, and potentially higher quality corn in years when in-season precipitation is average or below normal.

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