CRABGRASS: AN ALTERNATIVE CATTLE FORAGE

K-STATE Research and Extension

In eastern Kansas, pasture is the most important source of feed for livestock. In systems on cool-season forages, a lack of forage may occur during the summer. Because cool- and warm-season grasses have different photosynthetic mechanisms, one option to extend the grazing season is to have pastures with warm-season forage grass, such as crabgrass (*Digitaria* spp.), that produce most of the forage during hot months.

Knowing Crabgrass

Crabgrass is a forage introduced to the United States in 1849. It is an annual species, but due to its high capacity to produce seeds, allowing reseeding, it is considered a perennial forage. Crabgrass is considered a weed by many producers, but it can be a beneficial option to feed cattle because of its high yield and palatability. Its forage quality is higher than other warm-season grasses, such as bahiagrass and bermudagrass. Crabgrass has a clump-type growth habit, and, due to the presence of stolons (stems growing horizontally, which can produce roots), spreads aggressively. It can also be used as a cover crop.

Pasture Establishment

Crabgrass should be seeded in a clean area in spring when there is little chance of frost. Seeds should be drilled no deeper than ¼ inch. Seeds planted below ½ inch may result in a poor pasture stand. The seeds can also be broadcast, but it is recommended to cultipack after seeding to improve seed-soil contact and reduce loss due to a heavy rainfall.

A good stand (dense and healthy) can be achieved by seeding 4 to 6 pounds of pure live seed per acre. With adequate moisture, seed germination begins when the soil temperature reaches 55 degrees Fahrenheit. Pasture establishment can be sped up through nitrogen fertilization when the seeds have germinated, and tillers are in the early stages. Nitrogen input improves tillering and, consequently, reduces runoff and controls weeds.

Weed Control

Controlling weeds is essential as weeds will compete with crabgrass for water, nutrients, and sunlight. The best way to control weeds is to stimulate growth by maintaining adequate soil fertility levels, which will result in a rapid establishment and soil cover. The faster the pasture is established, the less chance weeds have to grow. If crabgrass is growing well, shading (lack of sunlight) will limit weed emergence and development. In addition, adequate harvest management helps to control weeds by avoiding overharvesting. When the stubble heights are lower than 3 to 4 inches, the plant reserves may be compromised, reducing the capacity and the velocity of regrowth. Lower stubble height may result in thinner stands where weeds will find room to emerge.

Herbicides can also be used to control weeds in association with harvesting management. Before using any herbicide, always consult the label for application restrictions and instructions, such as recommendations about rates, timing, and grazing restrictions. Only allow grazing after the grazing restriction period has ended. These recommendations can be found in the K-State publication, *Chemical Weed Control for Field Crops, Pastures, Rangeland, and Noncropland* available online at *https://bookstore.ksre.ksu.edu/pubs/chemweedguide.pdf*.

Fertilization and Harvesting Management

Soil fertility directly affects forage production and quality. It is important to highlight that fertilization should be done based on soil test results. Thus, the first step is to take representative soil samples to support an adequate fertilization program. Contact your local extension agent to receive instructions about soil sampling and soil tests.

During the establishment phase, phosphorus is the most important nutrient. Phosphorus stimulates root development and tillering, accelerating the pasture establishment and reducing the chance of runoff, erosion, and weed infestation. In an established pasture, nitrogen is the most important nutrient as nitrogen increases forage yield and improves quality. Potassium enhances the nitrogen effect

and needs to be taken into consideration in southeast Kansas, where potassium soil levels are commonly lower.

Harvest management is another factor that drives both forage production and quality. When forage plants are harvested, it stimulates the production of new leaves that have higher photosynthetic potential and nutritive value. In a rotational stocking system, the pasture should be grazed when the canopy height is not more than 12 inches to maintain high forage quality. Ideally, the best condition to graze a crabgrass pasture is when the canopy reaches 6 to 8 inches in height. At the same time, it is essential to keep the stubble height not lower than 3 to 4 inches. The same recommendation can be used to define hay harvesting.

Combining fertilization and harvesting management may be an interesting option to improve forage yield and quality. A 2-year (2020 and 2021) study was conducted in Columbus, Kansas, to evaluate how five combinations between two harvest managements (harvested once or twice; H1 and H2, respectively) and three nitrogen rates (0, 100, and 200 lb/acre; N0, N100, and N200, respectively) affect the agronomic performance of two crabgrass varieties ('Mojo' and 'Quick-N-Big').

For Mojo, forage production was higher when two harvests were combined with nitrogen fertilization (100 or 200 pounds of nitrogen per acre). For the Quick-N-Big, nitrogen fertilization increased the forage production regardless of the harvesting management in both years (Figure 1a). The total digestible nutrients (TDN) varied little between treatments, with values ranging around 50% for Mojo and 51% for Quick-N-Big (Figure 1b).

In both varieties, crude protein increased when the pasture was harvested twice and was higher as more nitrogen was applied (Figure 1c). The positive effect of nitrogen fertilization and two harvests on the forage production and crude protein resulted in a higher crude protein production per acre, mainly when two harvests were combined with 200 pounds of nitrogen per acre (Figure 1d).

Harvesting management and nitrogen fertilization can be used as tools to increase forage production and improve forage quality; however, fertilizer prices need to be considered. Based on 2023 fertilizer prices, the best management would be applying 100 pounds of nitrogen per acre with two harvests during the growing season. Nitrogen losses from mineral fertilizers are always a concern in forage systems, and split-applying nitrogen is an alternative to increase nitrogen-use efficiency. Thus, it is safe to apply 50 pounds after each harvesting avoiding major losses due to weather constraints. This combination resulted in the lowest cost per ton of forage produced and still had a good quality.

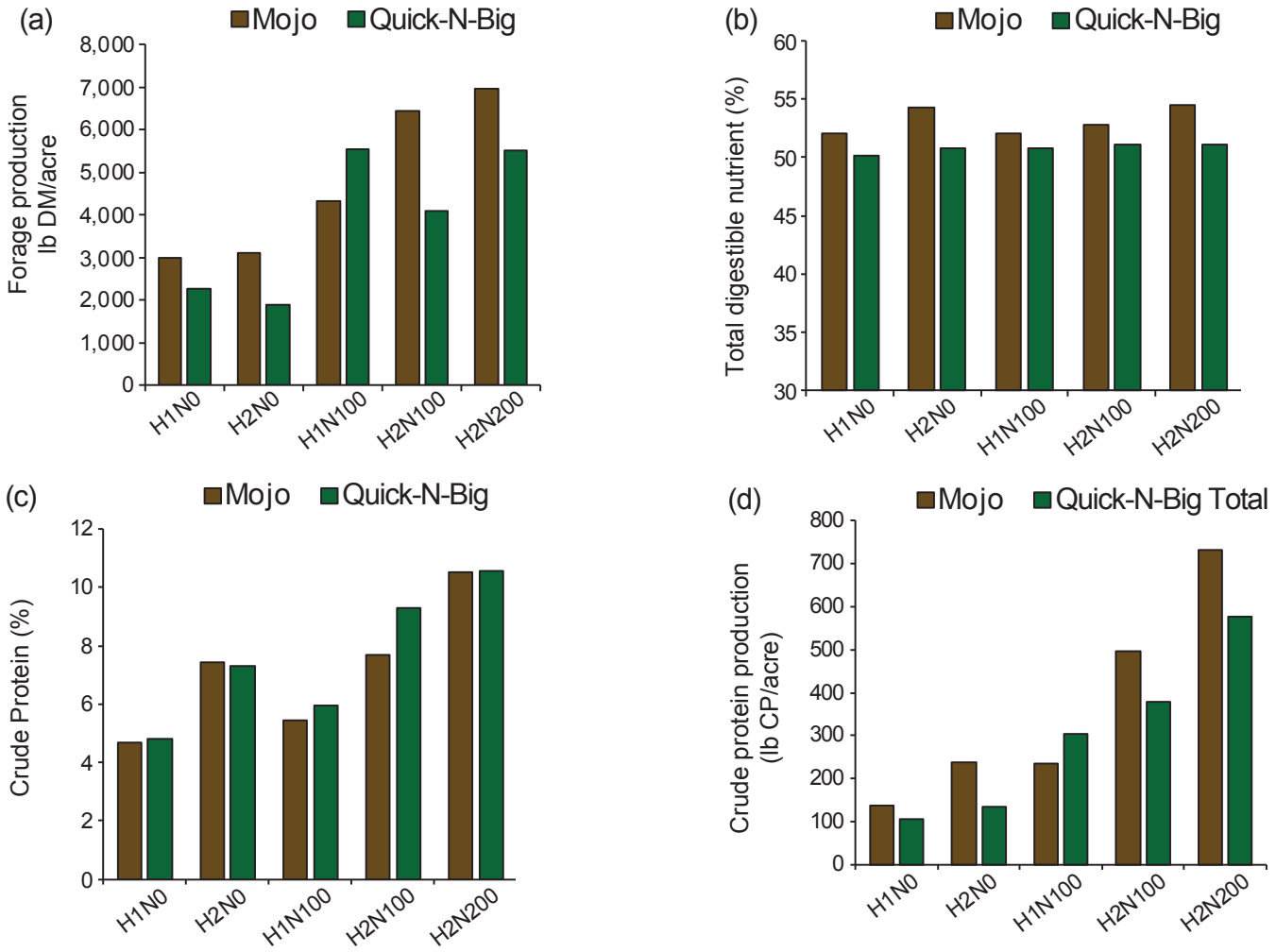

Figure 1. *Effect of N fertilization and harvest management on forage production (a), total digestible nutrients (b), crude protein (c), and crude protein production (d) in 'Mojo' and 'Quick-N-Big'.*

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