ALBERTA AGRISYSTEMS LIVING LAB

Utilizing Annual and Perennial Forages to Improve Productivity

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What can I do about low productivity pastures or increase my feed supply? Several beneficial management practices (BMPs) can improve pasture or feed yields, increase the proportion of desirable species in a forage stand, improve overall forage quality, or have beneficial impacts on soil quality. A variety of methods can be used to achieve these goals, such as grazing management, re-seeding, sod seeding, overseeding, utilizing different forage mixtures (for pasture or feed production), applying fertilizer/manure, and/or herbicide application. The benefits from using these practices may include increased yields, improved average daily gain, increased potential to retain soil moisture, more grazing days, reduced winter feed costs or impact of drought, and better body condition on cows[1].

Three producers have shared their firsthand experiences with BMPs including: intercropping, tame pasture rejuvenation, complex forage mixtures for silage, and using grazing to maintain a desired species composition; so that their insight and knowledge may help others looking to try these practices on their own operations.

Intercropping Wheat and Italian Ryegrass

Tame Pasture Rejuvenation

Forage Mixtures for Silage

Maintaining Optimal Species Composition with Intensive Grazing

[1] Omokanye, A., Yoder, C., Sreekumar, L., Vihvelin, L., & Benoit, M. (2018). Forage production and economic performance of pasture rejuvenation methods in northern Alberta, Canada. *Sustainable Agriculture Research*, *7*(2), 94-110.

Key Takeaways for Improving Feed Availability:

1. **Choose the right species and varieties for your region**: The amount of moisture at seeding is critical for success, so choose plants that are suited for your region and rainfall/soil moisture levels. The Beef Cattle Research Council's Forage U-Pick Tool can help with selecting species based on your field characteristics.
2. **Use grazing as a tool**: While it's true that deferring grazing is an important step to allow seedlings to establish, in some instances increased grazing pressure can open space for new seedlings while maintaining some of the old stand. This may help avoid a lost grazing year.
3. **Cut costs where you can**: In each of these cases, machinery used for seeding and fertilizing was already owned by the operation. If custom seeding or fertilizing is required, this can increase costs substantially, and you may need to get more creative.

Intercropping Wheat and Italian Ryegrass

Susan Heather started an intercropping project on her farm near Nanton, AB in 2023. The goal of this Alberta AgriSystems Living Lab Project was to reduce wind erosion, increase grazing days and capture more moisture during the three months the field would normally sit bare. The field sits on a reclaimed gravel site, and Susan wanted to do "just those little things to try and make it a little bit more productive" and add more organic matter.

The wheat was air seeded and Italian ryegrass was floated on the field the day after the wheat was seeded. The field was then rolled to prevent moisture loss and increase seed-to-soil contact. The intercrop was planted in an irrigated field. Wheat was silaged for feed for their finishing operation. Bred cows and heifers grazed the ryegrass in the fall. Susan felt that intercropping gave the ryegrass a "running start" so that it was ready for grazing shortly after the wheat was removed. Manure and urine from grazing returned nutrients to the soil and may reduce the amount of fertilizer needed in the future.

> "It's definitely a win for us, especially in a year when feed is so expensive."

The Heather's assumed the wheat crop yield would suffer because of competition with the ryegrass, but, to their surprise, they "saw an increase in tonnage off our Italian ryegrass with the wheat versus the check where [we] just had the wheat." The addition of this field to the pasture rotation reduced grazing pressure on their native grasslands. A warm December in 2023 allowed grazing to continue well into January, significantly reducing winter feeding time and cost.

Irrigation was a key factor in the success of this project; however, some other local dryland producers have had success with similar intercropping systems. It's important to consider your rainfall and soil moisture if you are considering intercropping, and it may be beneficial to consult with your local agronomist or seed representative. This is a BMP that may be useful for producers interested in gaining some additional grazing days from their crop fields, while also potentially reducing fertilizer use.

Top Tip

1. **Have a clear goal in mind**: This helps decide what tools to use and whether you are using the correct approach to achieve that goal. What are the specific improvements you want to see?

Tame Pasture Rejuvenation

In 2020, Terri and Brad Mappin wanted to improve a newly purchased piece of tame pasture on their farm near Byemoor, Alberta that hadn't been taken care of. Described by Terri as "a hodgepodge of we're not really sure what it was," Brad used an air seeder after a few runs with discs to get a more consistent grass/legume mix. Unfortunately, Brad seeded too deep the first time around, and didn't get much growth at all. After a few seasons of trial and error, and some timely rainfall, they got the thicker and healthier grass/legume mix they were hoping for.

A second pasture at the Mappin's operation that had been degraded after a few seasons as a calving pasture. They heavily grazed until mid-June, disced, seeded, and fertilized. The heavy grazing reduced competition for the new seedlings while also keeping some pasture available for one more quick grazing pass later in the summer. A key was the speed of this pass, as Terri mentions, "I skipped them through there fairly quickly (1-2 days max) so that they didn't get to those seedlings." The fear was that if the cows got past some of the previous litter and into the seedlings, they'd overgraze the tender new growth and jeopardize the newly established plants.

The Mappin's noticed increased calf weights because of the higher nutrition from the new stands, but a before- and after-rejuvenation comparison in terms of forage production was difficult because of drought conditions in 2021. However, they were able to keep a good stockpile of hay, and the rejuvenated pasture was still grazed the next year despite the dry conditions.

Top Tips

1. **Be adaptable**: Seeding is heavily dependent on moisture, so have seeding and grazing plans ready in the event of unfavourable conditions is key.
2. **Don't expect perfect results right away:** If you can, have additional feed on standby in case the new stand doesn't establish well, and be prepared for some trial and error until you find what works best for you.
3. **Start small:** Starting with partial rejuvenation project can spread out risk from drought , poor establishment, or slow new forage growth.

Forage Mixtures for Silage

Derek Friend switched to a 12-species forage blend for silage production in 2023 for his cow-calf operation in central Alberta. Previously, he planted a monocrop rotation of either barley, oats, wheat, peas, or canola on the field. The goal for this field was to find a silage blend that could balance lower inputs, rejuvenation the soil, and maintain acceptable yields. This new blend includes Italian ryegrass, radish, clovers, millet, forage rape, oats, other grasses, and barley as a base. Derek limited tillage on the field to a single disc pass instead of the typical 3-4 passes and seeded in May to make sure the warm-season species would not be caught in a late frost. No fertilizer was added either, so the total number of passes over the field was much lower than previous years.

Derek assumed the silage yield would suffer given the minimal tillage and lack of fertilizer, but, at about "10+ tons an acre," the result was likely closer to an average yield than lower harvest he expected. This ended up being a great result while keeping fuel and machinery costs low. Although this blend worked on Derek's operation, keeping expectations realistic and selecting species based on their ability to grow together are important factors for switching to these blends.

Maintaining Optimal Species Composition with Intensive Grazing

A strategy Derek uses to get the most out of his pasture and keep one species from becoming dominant is an intense, almost daily rotation for grazing. The move from a continuous summer grazing system to intensive rotational grazing, was done to keep all species in the pasture evenly grazed. Like the Mappin's, it's hard to compare body conditioning and average daily gain between years in the 2020s, but Derek has noticed his cows eating more from the competition for the best bites.

Top Tips

1. **Reducing tillage intensity can be a cost cutting measure**: While full tillage may produce a higher yield, it also adds costs and can be riskier if rainfall doesn't arrive in the time and amount needed.
2. **Use cattle to keep a good species mix**: Targeted heavy grazing can prevent less palatable species from becoming dominant and giving paddocks longer rest times give more palatable species more regrowth before re-grazing.