



Fall or spring management options for pastures: renovate or rejuvenate?

## BEST METHODS FOR PASTURE REJUVENATION

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**Background:** Pastureland accounts for 43% of total farm area in Alberta. Producing high quality forage and maintaining productive forage stands is critical to beef production, as about 80% of cattle feed is forage based. However, many pastures are treated with a “plant and forget” mentality, and with time, this leads to greatly reduced forage productivity, quality and carrying capacity. Older stands also tend to suffer from high soil compaction, reduced soil water infiltration, and reduced legume content (if legumes were originally present in a mixed stand).

**Objectives:** The objectives of this study are to:

1. Test a variety of methods to rejuvenate the productivity of low producing forage stands and improve soil conditions under a hay/ grazing system.
2. Examine the effect of herbicide application on brush control in pastures and forage stand rejuvenation.
3. Evaluate the economics of various pasture rejuvenation methods.

**What they did:** This project took place over three years on two sites, at the Wanham grazing reserve (grey-wooded soil) in northwestern Alberta, and Oyen (brown soil) in eastern Alberta. Baseline measurements including organic matter, compaction and fertility were obtained at both sites to inform pre-rejuvenation conditions at each site. Treatments applied in 2016 included an untreated control, aerate/spike in the fall, aerate/spike in the spring, break and reseed, broadcast seed and aerate/spike in the spring, broadcast seed and aerate/spike in the fall, broadcast seed in spring, a fertilizer application according to soil test results, spray Grazon™ in spring, spray Grazon™ and direct seed in the spring, defer grazing for one year, spray Roundup WeatherMax® in the fall and broadcast seed in the spring, spray Roundup WeatherMax® in the spring, and spray Roundup Weathermax® in the spring and direct seed in the spring. At Wanham the forage seed mixture used for direct and broadcast seeding contained 40% hps® meadow brome, 35% hps® orchardgrass, 20% hps® alfalfa, and 5% Grindstad timothy. At Oyen, the mixture contained 40% MB-A meadow brome, 16% AC Grazeland alfalfa, 8% Dahurian wildrye, 7% slender wheatgrass, 15% Kirk crested wheatgrass and 15% Duramax tall fescue. Forage yield and quality measurements were taken from all treatments in both 2017 and 2018 and a partial budget analysis performed.

**What they learned:** Due to a variety of circumstances, not all treatments were performed at both sites.

Wanham site: In both 2017 and 2018, using Roundup Weathermax® in the spring followed by direct seeding, a fertilizer application applied according to soil tests, and broadcast seeding with aerate/spike in the spring had consistently higher forage yield than the other rejuvenation methods. These increases ranged from 52-90% higher in 2017 and 18-75% higher in 2018 than the non-rejuvenated plot, averaging over 1700 kg/ha more forage for the Roundup/direct seeding treatment, 890 kg/ha for the fertilizer treatment, and 490 kg/ha for the broadcast and aerate/spike treatment per year over both years after the treatments were imposed. In addition, these three methods of pasture rejuvenation tended to increase forage crude protein, but only for the year immediately following rejuvenation, and total digestible nutrients were not impacted by rejuvenation method. Mineral analysis demonstrated that supplementation would be necessary under all rejuvenation strategies to meet animal requirements.

Even though more costly upfront, the Roundup/direct seeding in the spring resulted in \$380/ha more profit than the un-rejuvenated plot, followed by aerate/spike in spring and fertilization at \$129/ha and \$127/ha, respectively over the two years following rejuvenation.

Oyen site: In both 2017 and 2018, no method improved forage yield significantly over the un-rejuvenated control, and especially in 2017, some treatments seemed to have a negative effect on forage yield. This is likely due to the significantly lower rainfall experienced at this site in 2017 and 2018, drastically limiting forage production. However, aerate/spike in the fall and deferring grazing improved combined two-year forage yield by 985 kg/ha and 1094 kg/ha, respectively, over the other rejuvenation methods. Deferring grazing for a year also significantly increased crude protein and calcium to phosphorus ratio compared to the other treatments and the un-rejuvenated

control, but again, supplementation would be required to adequately meet animal requirements.

Although no rejuvenation method in this particular set of circumstances was more profitable than the control, deferred grazing and aerate/spike in the fall, showed the lowest economic loss at (\$188)/ha and (\$154)/ha, respectively.

**What it means:** There are several pasture rejuvenation options available to producers that are superior to break and reseed. Which method is right for you will depend on how depleted the pastures are in terms of soil nutrients, the ability to take on up-front capital costs, whether or not legumes are present in the stand, and whether the weather cooperates. Trying to rejuvenate pastures in a low moisture situation will likely be a losing proposition. Ensuring adequate weed suppression prior to direct seeding is critical to success, and while fertilization may provide an initial forage yield boost, it may not persist past the first couple of years after application.

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