

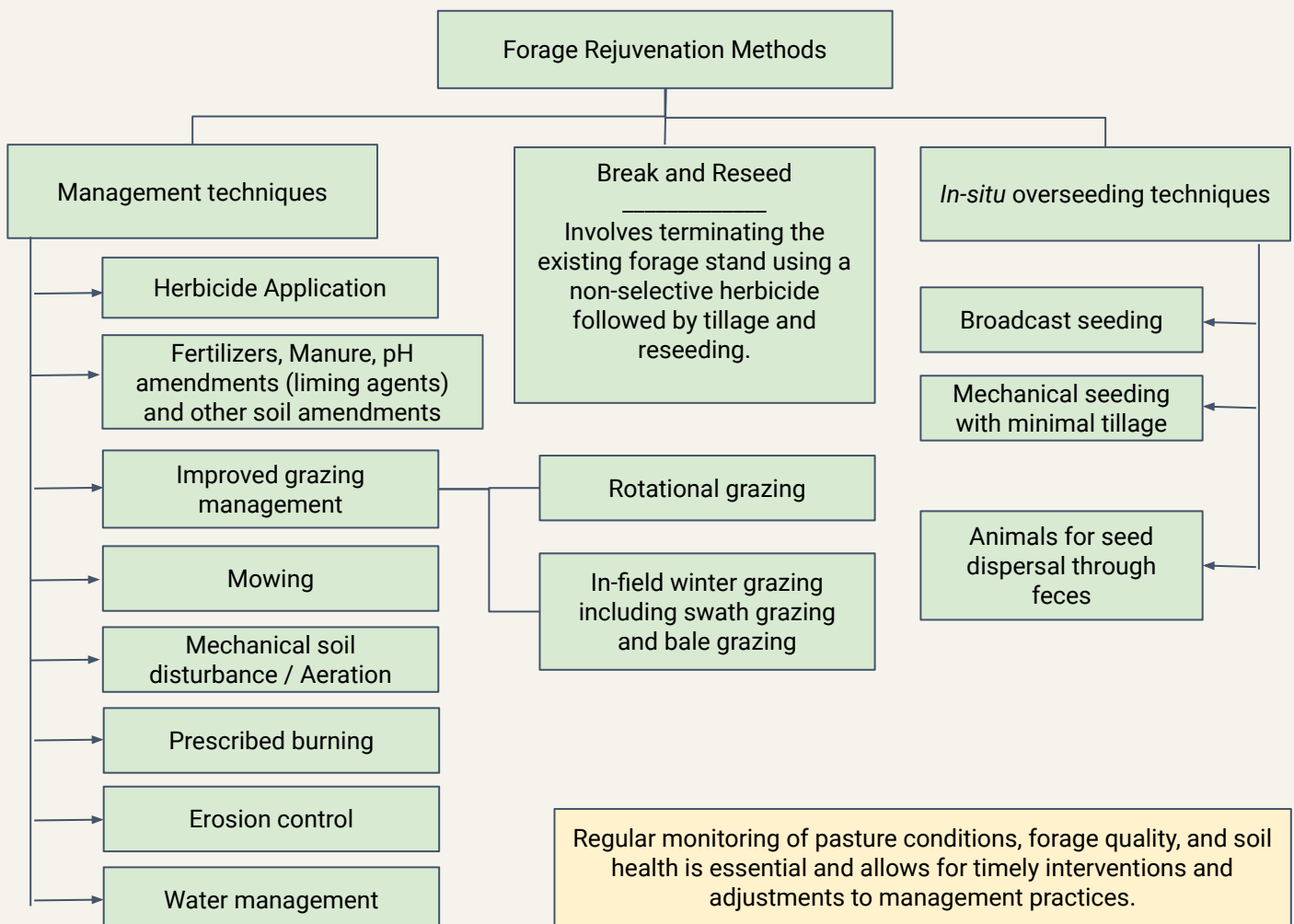


FORAGE REJUVENATION

Forage rejuvenation refers to the process of restoring or improving the health, productivity, species composition and sustainability of a pasture or grazing land. Over time, pastures can become degraded due to several factors such as overgrazing, soil erosion, nutrient depletion, drought, pest damage and increased weeds. Rejuvenating pastures is essential for maintaining healthy forage ecosystems, promoting livestock well-being, and ensuring sustainable and profitable agricultural operations.



FORAGE REJUVENATION TECHNIQUES



AGRISYSTEMS

FACT SHEET

Forage rejuvenation techniques range from simple and less expensive management techniques to drastic approaches involving total replacement of the existing pasture. The management options may take several years to achieve significant improvement in pasture composition but they may result in the greatest change for each dollar spent. Some management techniques, such as fertilizer application, may be used together with other techniques to better improve the forage composition and productivity. Fertilizers are particularly important in haylands due to offtake of nutrients.

1. Management Techniques

There are several management approaches that can be utilized to improve pasture productivity. These include:

01

a. Mowing

Mowing can be effective in controlling the growth of unwanted plants such as weeds and brush. Generally, mowing favors grasses, which have higher defoliation tolerance and regrowth potential. Repetitive mowing is more effective in controlling woody plants and weeds such as thistle, therefore increasing grass dominance over time. Mowing can be combined with high intensity grazing where livestock will browse the new suckers of woody plants further preventing their growth.



Image: Mowing

b. Herbicide Application

Herbicides can be used alone or as part of other forage rejuvenation techniques. Selective herbicides can be used to control specific plant species such as weeds and woody plants. We recommend producers to contact their regional agrologist for more specific herbicide usage recommendations.

Herbicides application may be combined with rejuvenation approaches that involve seeding new plant species especially with the break and recessed approach. Herbicides may not be necessary when overseeding legumes, although in some cases, herbicides may be used to reduce competition from existing plants to allow new seed to germinate and establish better.

c. Mechanical Disturbance

This technique is aimed at modifying physical soil and/or plant conditions using mechanical treatments. It can achieve positive results through:

- Increasing soil aeration and breaking down soil layers and improve soil permeability
- Reducing water runoff and increase infiltration
- Breaking up roots and releasing nitrogen and other nutrients to increase plant vigor.

- Stimulating the plant community for greater productivity and yield



Image: Mechanical disturbance

We recommend producers limit the use of these practices to terrain and soil conditions that are conducive to this type of mechanical treatment.

Mechanical disturbance can result in an increase in noxious or invasive plants following treatment.

Ensure the treatment and resulting conditions are suitable for grazing animals, or keep animals off the treated areas until conditions are suitable.

d. Fertilisers and Other Soil Amendments

Fertilisers can be used alone or in combination with other approaches to promote growth and increase forage yields. Soil tests may be required to determine the need and rate of fertiliser application. Optimum nutrient uptake by most crops occurs at soil pH between 6.0 and 7.0. Low pH soils are more common in grey wooded soils or soils that have a long history of fertilization. Grazing lands that were once haylands usually have very low nutrient profiles due to the offtake of nutrients and, during grazing, these nutrients are unevenly redistributed back onto the land as manure and urine resulting in areas with very little nutrients and patches of high nutrients.

Acidic soils can be amended by applying a material that contains some form of lime or an effective calcium carbonate equivalency. Please note that lime should not be applied at the same time as fertilizer to prevent interactions with the fertilizer before incorporation in the soil.

Depending on soil analysis results, nutrients may also be supplied to the soil by using manure or compost. These can provide the required nutrients and also add organic matter to the soil, which has several other benefits such as improving the soil microbiome.

Ideally, the manure or compost should be tested for nutrient content to determine the application rate.

Manure is an essential component of whole farm resource management and can be a way to return nutrients to the soil once they have been extracted by grazing livestock.

e. Prescribed burning

Burning has been used for thousands of years as a traditional farming practice to rejuvenate grasslands and/or manage excess residue. Burning is carried out for a variety of reasons such as removing excessive vegetation, increasing plant productivity by increasing photosynthetic capability, controlling weeds and insects, and to reduce diseases where dead biomass could host pathogens. Burning can be used to create short term benefits such as increasing soil temperature, soil moisture, and nutrient availability.

Despite these short term benefits, burning can result in long-term detrimental effects such as a reduction of soil organic matter and nutrients, decreased water-holding capacity, and increased soil erosion. Prescribed burning is risky and caution must be taken when burning vegetation in dry prairie and foothills regions. A permit is required for producers to implement prescribed burning.

AGRISYSTEMS

FACT SHEET

f. Grazing Management

Grazing management techniques can be used alone or in combination with other techniques to improve pastures.

Various forms of rotational grazing and Adaptive Multi Paddock (AMP) grazing, which allow pastures to rest can be useful to increase the vigor and promote growth of forage plants. The goal is to gain control over when and how often plants are grazed by preventing animals from grazing the desirable plants over and over again.

Producers should be attentive to the timing of grazing, frequency, intensity, and periods of rest as these factors have the potential to influence the recovery and growth of plants. Well planned fencing and access to water sources will allow for control of grazing pressure and livestock distribution.

Summer AMP grazing and in-field winter grazing through swath grazing or bale grazing can also be used to evenly distribute manure and urine, which will provide nutrients to the soil on depleted pastures. Hay bales containing seedheads may also help to reseed pastures, which will be beneficial if the hay was obtained from desirable plant species.

2. Overseeding on existing pasture

Degraded pastures can be improved or rejuvenated by seeding new plant species into the existing pasture. This non-destructive addition to the pasture may be necessary when there is an insufficient quantity of legumes or useful perennial grasses but not severe enough to require re-seeding.

02

Please note that it is more challenging for grasses to establish when reseeded into existing pastures because grass seedlings do not compete well. This technique may work more successfully when overseeding legumes. The cost of overseeding can range from minimal to high depending on input costs and the application technique used.

In order for overseeding to be successful, producers should ensure that it is done at the right time for both the desired plant species and for the germination of weeds. Spring seeding is better because the seeds don't have to stay on the ground throughout winter before they can germinate. Frost seeding is the practice of broadcasting seeds when the soil is already frozen or subject to frosts. Dormant seeding is seeding the crop in late fall before freeze-up.



In addition, choose forage species and varieties suited to the environmental conditions, and ensure pest control is in place.

Over-seeding may involve the whole pasture or may only be required in some parts of the pasture where the useful plant species have thinned out.

Grazing of the newly seeded pasture should not be done until it is well established. Pastures over-seeded in late fall/winter may need to be rested until late summer or early fall the following year.

Where necessary, the use of a non-selective herbicide, such as glyphosate, may be used to suppress existing and actively growing vegetation in order to allow for successful establishment of new seedlings. If not suppressed, the competition from the established plants, for both nutrients and soil moisture, will greatly reduce establishment of the new forage seedlings. The success of sod seeding is largely dependent upon adequate soil moisture and seed to soil contact to allow new seedlings to establish.

3. Break and Reseed

If your pasture assessment shows that there are minimal useful species left in the pasture and the pasture rejuvenation techniques may not be successful, then starting again with a new pasture might be the only option.

03

This approach involves terminating the existing stand using a non-selective herbicide, followed by tillage and reseedling. This option is expensive and will remove the pasture from grazing for around 12-18 months depending on soil moisture conditions. Often it can be difficult to recoup these costs within a reasonable time frame, therefore the decision to break and reseed pastures should be considered carefully.



Economics of Pasture Rejuvenation

Whether a producer is part time or commercial, good pastures are profitable. They can provide an economical source of livestock feed, reduce labor requirements, build soil tilth and fertility, reduce erosion, and reduce invasions of noxious and poisonous weeds. Accurate assessment of forage economics is complicated because forages, in general, influence the plant-soil-animal continuum and the interactions between all three must be studied. The various components and their interactions also complicate the economic picture of forage rejuvenation. The economic assessment should consider the balance that must exist between inputs and outputs. The goal should be to balance the things brought into a forage-livestock operation (inputs) with the results (outputs) within the perspective of sustaining the resources. Decide carefully where to put each dollar by looking at the larger picture over the long term.

The Alberta AgriSystems Living Lab (AALL) is utilizing a participatory action research model to support Alberta's producers to adopt beneficial management practices (BMPs) including **pasture rejuvenation**. Our team of researchers from the University of Alberta (UoA), Agriculture and Agri-Food Canada (AAFC), subject matter experts and consultants are measuring the impacts of these BMPs on the profitability and environmental sustainability of the whole farm. AALL is led by the Alberta Beef Producers collaborating with over 16 other livestock, crop and environmental organizations aimed at improving the sustainability and resilience of Alberta's livestock, crop and forage producers. For more information, please visit our website at agrisystemsll.ca.



ALBERTA
AGRISYSTEMS
LIVING LAB

Canada