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Grasses and Legumes for Intensive Grazing in Michigan

Michigan State University

Cooperative Extension Service

W.J. Moline, J. M. Middleton, and R. Plummer, Department of Crop and Soil Sciences

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Grasses and Legumes for Intensive Grazing in Michigan

Intensive grazing, high tech fencing and new watering devices are enabling farmers to capitalize on low-cost, high-profit pastures. Their goal is to take advantage of the productive forages that grow in Michigan. The grazing season typically begins in May and continues through early November. Farmers using intensive grazing quickly discover that they must use not one but several pasture species to provide feed over the 5- to 6-month grazing season. Assuring pasture persistence and productivity requires careful planning.

Intensive grazing is a system in which small pasture areas are grazed for three days or less before livestock move on to other paddocks. There are several differences between intensive grazing and other grazing and harvesting systems. In intensive grazing, temporary fences are used to open up new pasture and to prevent the animals from grazing regrowth until the plants have again reached 8 to 12 inches in height. The grazing period is usually three days or less.

Farmers can do a great deal through management and fertilization to improve naturally

seeded permanent pastures. Many farmers must start with newly seeded fields or pastures, however.

This bulletin will discuss principles of pasture management for intensive grazing and recommend forage species and mixtures for use in intensive grazing.

I. Some Basic Principles

Selecting the site, grazing to eliminate brush, planting new mixtures and using intensive grazing schedules are management options for productive pastures. Intensive grazing enhances the composition of pastures through frequent but intensive defoliation.

Most pastures are on sites that are often too wet, too steep, too small, too rocky or for some other reason not suited for row crops. Most fields that are not already in good pasture will need seedings of grass and legumes to become productive. If

new fences are needed or the land needs to be drained or shaped, make plans to complete the work well in advance of seedbed preparation and seeding.

Quackgrass is an aggressive invader, and we suggest using herbicides or tillage to destroy it

**W.J. Moline, J.M. Middleton,
and R. Plummer
Dept. of Crop and Soil Sciences**

Michigan State University

before attempting to seed legumes. In some cases, mob grazing with young livestock, sheep or goats can be used to weaken brush, weeds and undesirable grasses. Most livestock avoid thistles, so these need to be removed by herbicide application or physically destroyed. Thorny briars must also be removed, as well as any poisonous plants—such as bracken fern and water hemlock—before a new pasture is seeded.

A good grain and grassland drill should be able to place the seed 1/2 to 3/4 inch into the soil and band the fertilizer below the seed. Rollers and cultipackers are used to firm the seedbed and cover the seed with less than 3/4 inch of soil. Frost and snow seedings are possible in Michigan but are limited to red clover, birdsfoot trefoil, ladino clover and most improved cool-season grasses. New seedings of alfalfa alone or alfalfa mixed with grasses need the advantage of a clean seedbed. The seedbed can be prepared mechanically or with no-till methods combined with herbicides.

New seedings can be made almost any time between April 1 and August 15 in lower Michigan and before August 1 in the Upper Peninsula.

II. Developing a pasture plan

Permanent pastures are seedings designed to be productive for 10 years or more. Once established, legumes such as white clover reseed themselves and need only sunlight from close grazing and phosphorus and potash to make lush pastures. Few weeds will be found in intensively grazed pastures because close grazing and rest periods between grazings will encourage clovers and grasses to grow vigorously.

Cropland pastures are a mixture of grass and legumes planted for hay production that will eventually be used for pasture.

For planning purposes, start with 60 percent of the area designated for pasture and 40 percent for hay. Plan to use 20 percent of the land for either hay or pasture, depending on the weather. Because of the potential for wide swings in Michigan's weather, an inventory of feed is essential, as is planning for a small reserve of either hay crop or pasture. Pastures that become too mature should be cut for the hay reserves.

Emergency pastures are needed in unusual situations. Plantings of Sudangrass or sorghum-Sudangrass hybrids; small grains such as oats, rye and triticale; and turnips, kale or other brassicas will make good pasture. The most difficult part is planning far enough in advance to get some summer feed growing before you need the pasture. Because of the cost of seeding each year and the management difficulties, few producers repeatedly use annuals for pastures.

Some mistakes in grazing can be corrected. The most difficult mistake to recover from is a cycle of accelerated grazing. Rushing to use a paddock before it has had a chance to regrow properly decreases the amount of top and root regrowth and leads to the decline of desirable pasture species. Plan to use extra paddocks in the summer when cool-season grasses and legumes are growing more slowly than during the spring.

We offer three options to help plan the amount of land used for grazing. The first is to use experience to judge the amount of land needed for intensive grazing. The second is to, as a general rule, use one acre of pasture for each day of grazing for 50 cows. The third, though more complicated, is the pasture calendar schedule. (See Extension bulletin E-2304, "Pasture Calendars for the North Central United States.")

Generally, access to water within 600 to 1,000 feet of the grazing area is needed. The ideal is to have water in each paddock as the animals graze. Water intake is vital for productive animals, and it is wise to reduce the distance that animals must travel to drink.

III. Site Selection

The best soils for growing row crops also make the best sites for hay or pasture production. Whatever the site, soil tests are a good investment. Taking soil samples is the first and most important step in establishing a productive and profitable pasture. If a soil test shows lime is needed, work it into the seedbed before seeding starts—preferably, at least six months before a new seeding is made. Prepare a weed-free seedbed that is firm enough to work without leaving machine tracks, and that allows seed to be placed 1/2 to 3/4 inch deep. Planting grass and legume seeds too deeply is the major reason for stand failures.

IV. Selecting the grasses and legumes

Pasture grasses and legumes must be matched with the growing conditions of the pasture site. Alfalfa, for instance, requires well drained soils, while red clover can tolerate moderately to poorly drained soils. White clover can tolerate poorly drained soils but is seldom seeded because it will appear naturally in the pasture under intensive grazing. Alfalfa and red clover can be very productive on loams and sands. Sandy sites are often too droughty for clovers but can be made into good alfalfa hay fields. Birdsfoot trefoil is slower to establish and does best if seeded with a less aggressive grass such as timothy or Kentucky bluegrass. Specific site requirements should be considered when selecting improved grasses and legumes.

V. Pasture seeding and renovations

A. Alfalfa

Alfalfa is our first choice for seeding and use in intensive grazing because it's high yielding, drought resistant, palatable and generally long lived. It requires well drained, fertile sites and a neutral soil pH of about 6.7 to 7.0. It also requires high levels of phosphorus and potash. Intensive grazing schedules should allow 25 to 35 days between grazing periods, as well as a fall rest period to promote winter survival. Bloat is always a hazard when grazing ruminants on alfalfa, so producers should take care to seed at least 50 per cent grasses in the mixture, or feed the bloat preventive poloxalene.

B. Red Clover

Red clover is well suited for hay and can be grazed. It can be frost seeded or seeded with small grains to establish new seedings that last two or three years before reseeding is needed. Red clover is easily established in new seedings. Intensive grazing will promote its reentry into older grass pastures from dormant residual seeds. In most pastures grazed with an intensive system, clovers will reseed at levels that are about 20 to 30 per cent of the pasture forage. When frost or snow seeding red clover into an existing pasture, seed during late winter at a rate of 6 lb per acre.

C. Birdsfoot Trefoil

Birdsfoot trefoil is a long-lived, self-reseeding legume that does not cause bloat, so it is ideal for grazing. It is more difficult than alfalfa to establish and manage as a hay crop. The seeds are small and are easily planted too deeply. Frost and snow seedings are successful. If seeding birdsfoot trefoil with grass, use a non-aggressive grass. You can also seed it alone and allow Kentucky bluegrass to invade. Birdsfoot trefoil is suited to sites ranging from droughty to poorly

drained, and it can be seeded over a wider range of soil pH than alfalfa.

D. Ladino and White Clover

Ladino clover is a giant form of white clover. Common white clover is seldom seeded in Michigan because it volunteers easily. Rather than seeding white clover, use intensive grazing and timely phosphorus applications to encourage the clover. Bloat is a hazard whenever this clover makes up more than 50 per cent of the sward. White clover grows well on sites that are too wet for either red clover or alfalfa. Where white clover is being introduced, 1/2 lb per acre is adequate mixed with grasses of your choice.

E. Alsike or Swede Clover

Alsike clover will grow well on soils that are too wet for red clover. It is short lived but reseeds itself under intensive grazing. Alsike will tolerate soils with a pH too low for red clover or alfalfa. Bloat is a hazard. When introducing alsike, 1/2 lb per acre is adequate. Mix with the grasses of your choice.

VI. Forage grasses

A. Bromegrass

This grass is palatable over much of the grazing season. Unlike most grasses, bromegrass does not lose much of its feed value after heading. It is highly productive when mixed with legumes or fertilized with high levels of nitrogen fertilizer. First-year yields after seeding are not as high as those you can expect after several years of use for hay or pasture. Bromegrass is ideally suited for intensive grazing pastures throughout Michigan. Improved varieties are preferred over older varieties because of higher yields, disease resistance and better vigor. Bromegrass is usually seeded with alfalfa.

B. Timothy

Timothy is an erect bunchgrass. It is easy to establish with any of the legumes and

is not as aggressive as bromegrass or orchardgrass. Timothy is drought resistant, recovers well after grazing and is more palatable than reed canarygrass. This grass is capable of very high yields with adequate fertility, and it reestablishes easily under intensive grazing. A number of improved varieties are available. Timothy tolerates the shady conditions in improved woodlot pastures.

C. Orchardgrass

Orchardgrass is a bunch-type grass that persists well on all but very poorly drained sites. It is drought resistant and easy to establish, and it will persist better than other grasses under hay conditions. Orchardgrass will reseed itself under intensive grazing management. Though it is not as winter hardy as other grasses such as bromegrass, it is adequate for all of Michigan. The quality of orchardgrass is often a problem during the summer. Even though orchardgrass will grow well during July and August, it often becomes infected with rust and other leaf diseases. This very dramatically reduces the quality, and cattle will eat just about everything else first.

D. Reed Canarygrass

Reed canarygrass is a very widely adapted grass, suitable for both very droughty and wet sites. Of the grasses, it is the least desirable in pastures because of palatability problems that are reflected in animal performance. It does not tolerate early-season close defoliation and often will not survive unless it's allowed some relief after early use to replenish its growth reserves. Few legumes will survive in a mixture with reed canarygrass.

E. Kentucky Bluegrass

Kentucky bluegrass will invade most pastures and is not seeded other than in parks, lawns, and very special horse and pet paddocks. It is excellent for pastures and very palatable. The main disadvantage of this grass is that, with hot summer

temperatures and a shortage of rain, the grass will go dormant on well drained sites. This grass is ideally suited for intensive grazing and is likely to dominate the pasture after several years of grazing.

VII. Other cool-season grasses

Many other grasses may interest pasture enthusiasts, but, given the opportunity to manage through intensive grazing, we think that you will want to seed them only under special conditions. The following grasses may be used under special conditions:

A. Tall Fescue

This grass can be used for difficult sites such as pet yards, athletic fields, roadsides and parks. If seeding for pasture, use the new endophyte-free varieties. They are somewhat slow to establish but are free of a fungus that causes poor animal performance.

B. Redtop

This grass is adapted to wet and acid soils. It is extremely low in palatability and not recommended for pasture.

C. Chewings Red Fescue

Including this grass in a horse or pet pasture mixture is a mistake. It will withstand traffic and so can be used on areas to be used as animal traffic areas, but because it has very poor palatability it is not a good pasture grass. Chewings red fescue is a bunchgrass that requires close trimming or it will make a rough area. It grows well under heavy shade.

D. Perennial Ryegrass

This grass is well suited and widely used for pastures in the United Kingdom, New Zealand and elsewhere. Most American varieties of ryegrass, however, are not sufficiently winter hardy to survive in Michigan. Most of the research on using ryegrass for pasture in Michigan was con-

Table 1. Seeding Mixtures

The following mixtures are recommended:

On well drained clay, loam or sandy soil, use one of the following:

No. 1	
Alfalfa	8-10 lb/acre
Smooth brome grass	6 lb/acre
No. 2	
Alfalfa	8-10 lb/acre
Smooth brome grass	4 lb/acre
Timothy	2 lb/acre
No. 3	
Alfalfa	8-10 lb/acre
Smooth brome grass	4 lb/acre
Orchard grass	2 lb/acre
No. 4	
Alfalfa	8-10 lb/acre
Timothy	2 lb/acre
No. 5	
Birdsfoot trefoil	5 lb/acre
Smooth brome grass	4 lb/acre
Orchard grass	2 lb/acre
Timothy	2 lb/acre

On soils with variable drainage with some poorly drained soil, use one of the following:

No. 1	
Red clover	6 lb/acre
Smooth brome grass	4 lb/acre
No. 2	
Red clover	6 lb/acre
Timothy	3 lb/acre
No. 3	
Red clover	6 lb/acre
Ladino clover	1/2 lb/acre
Orchard grass	4 lb/acre
No. 4	
Birdsfoot trefoil	5 lb/acre
Smooth brome grass	4 lb/acre
Orchard grass	2 lb/acre
Timothy	2 lb/acre

On wet mineral soils, use one of the following:

No. 1	
Birdsfoot trefoil	5 lb/acre
No. 2	
Birdsfoot trefoil	5 lb/acre
Smooth brome grass	4 lb/acre
No. 3	
Birdsfoot trefoil	5 lb/acre
Timothy	2 lb/acre
No. 4	
Birdsfoot trefoil	5 lb/acre
Reed canary grass	8 lb/acre

ducted before plant breeders in Europe, Australia and New Zealand introduced winter-hardy varieties. Renewed interest in ryegrass by the turfgrass industry has resulted in research showing several ryegrass varieties surviving well in Michigan. This is encouraging because of the very high quality of ryegrass as pasture and its compatibility with clovers

and birdsfoot trefoil. Field experience suggests that you can expect some varieties to survive 3 to 5 years. Some Michigan dairy producers are using perennial ryegrass for very early pasture. Sowing rates of 20 to 30 lb per acre are recommended, and fertilizer requirements are high.

Related Publications

E0752 Pastures for Northern Michigan, 8 pp. (40 cents).

E1013 Harvest Management: Prevent Forage Harvesting Losses, 4 pp.

E1014 Harvest Forages Early for Maximum Production, 4 pp.

E1029 Harvesting, Storing Crops for Silage, 2 pp.

E1237 The European Skipper – A Pest of Grass Hays, 2 pp.

E2068 Protecting Field/Forage Crops from Armyworms 4 pp. (55 cents).

E2126 Annual Summer Forage Production in Michigan, 8 pp. (60 cents).

E2185 Improving Pastures in Michigan by Frost Seeding, 4 pp. (25 cents).

E 2304, Pasture Calendars for the North Central United States, 4 pp. (35 cents).

E2305, Hay and Pasture for Horses in the North Central United States, 8 pp. (50 cents).

NCR368 Sheep Pastures for the Midwest, 12 pp. (65 cents).

VT031 Principles of Controlled Grazing (videotape) (\$25.00).

WQ29 Manage Pesticides on Hay/Forage – Avoid Contaminating Water, 2 pp. (30 cents).

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