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AGRONOMY guide

COOPERATIVE EXTENSION SERVICE, PURDUE UNIVERSITY, WEST LAFAYETTE, INDIANA (PASTURE) AY-208

Producing Small Grains for Forage

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Wheat, oats and rye are generally planted for grain, but they may also help meet the forage needs of livestock producers. The following are three ways that small grains may be used for forage.

1. Circumstances sometimes arise which make it desirable—even necessary—to harvest cereals for silage, hay or pasture. Prospects of severe reduction in grain yield or the need for extra forage because of a poor first cutting of hay are examples of such circumstances.

2. Small grains may be planted with the intention of fall and/or spring grazing before they are harvested for grain.

3. Small grains are sometimes grown alone or with legumes as a silage or hay crop to be followed by soybeans or by corn or sorghum for silage.

This publication is for the livestock producer who occasionally or routinely uses cereal crops for forage purposes. Summarized in the table on page 2 are the recommended management practices associated with growing and harvesting these crops as silage, hay and pasture. These practices are discussed more fully in the paragraphs that follow.

Varieties to Plant

The wheat, oat and rye varieties commonly grown for grain are also the best choices for hay or pasture because of their adaptation. If used exclusively for forage, stem strength is a less critical factor unless the higher rates of nitrogen shown in the table are used.

Awnless varieties of cereals make more palatable hay than do the awned types. In the case of rye, tetraploid varieties bred primarily for grain

production are less desirable for quality hay because of their stemminess.

Planting Dates

If small grains are grown for hay or silage, they should be seeded at the same time as for grain production. If they are to be fall grazed, seed about 2 weeks earlier than for grain.

In some years, diseases such as take-all and barley yellow dwarf have cut grain yields as much as 80 percent in early-planted wheat. Planting on land that has not recently been in wheat or grass will help reduce the chance for loss from these diseases.

Planting Rates

Use the same cereal crop seeding rates for silage production as for grain production—i.e., 1.5-2.0 bushels per acre for wheat and rye, and 3.0 bushels for oats. An increase of 30-100 percent above these rates is suggested for hay; small grain hay is likely to be less stemmy when higher seeding rates are used. These heavier rates may also be used for silage, since earlier harvest reduces the likelihood of lodging.

Fertilizer Rates

Fertilize small grains heavier for forage than for grain production. In general, one third more N, P₂O₅, and K₂O should be applied if the crop is to be both pastured and harvested for grain, or if it is to be taken for silage.

The fertilizer rates in the table should be regarded as rule-of-thumb values to be used only in emergency cases when no soil test is available and immediate decisions must be made. It is highly recommended that soil tests be taken and fertilizer rates based on the results.

Management Practices for Producing Small Grains as Forage Crops

Item	Spring oats	Soft red winter wheat	Winter rye
Planting information			
Varieties to plant	Late-maturing, tall, grain types (e.g., Dal, Holden, Wright)	Commonly grown grain types (e.g., Oasis, Arthur 71, Downy)	Conventional grain types for silage and pasture (e.g., Balbo); use nontetraploid types for hay
Planting date ¹	March-April	September-October	September-October
Planting rate ²	2.0-4.0 bu./acre	1.5-3.0 bu./acre	1.5-3.0 bu./acre
Fertilizer rate ³			
Nitrogen (N) ⁴	60-90 lbs./acre	60-90 lbs./acre	60-90 lbs./acre
Phosphorus (P ₂ O ₅) ⁵	90 lbs./acre	90 lbs./acre	90 lbs./acre
Potassium (K ₂ O) ⁵	90 lbs./acre	90 lbs./acre	90 lbs./acre
Harvesting information			
Harvesting as silage			
When to harvest ⁶	Direct cut in early to mid-dough stage	Cut in late milk stage and wilt to below 70% moisture	Cut in boot to early flower stage and wilt to below 70% moisture
Harvesting as hay			
When to harvest	Milk to early dough stage	Boot to milk stage	Boot stage or earlier
Harvesting as fall pasture			
When to graze ⁷		When 6 in. tall	When 6 in. tall
Cover to leave for regrowth		2-3 in.	2-3 in.
Target carrying capacity		3-5 acres/cow	5 acres/cow
Harvesting as spring pasture			
When to graze	When 6 in. tall	When green to mid April ⁸	When green to mid April
Cover to leave for regrowth	3-4 in.	3 in.	4 in.
Interval between grazings	2-4 wks.	2-4 wks.	2-3 wks.
Target carrying capacity	2-4 acres/cow	2-4 acres/cow	2-4 acres/cow ⁹
Yield potential			
As silage (65% moisture)	8 tons/acre	8 tons/acre	5 tons/acre
As hay (14% moisture)	2-4 tons/acre	2-4 tons/acre	2-4 tons/acre
As pasture if grain harvested	1000 lbs. dry matter/acre	2000-3000 lbs. dry matter/acre	2000-3000 lbs. dry matter/acre

1. If fall grazing is intended, seed 2 weeks earlier than for grain. In the case of wheat, use fly-resistant varieties.

2. Use the high rate for the following circumstances: (1) if grazing both fall and spring, (2) if growing for hay, (3) if planting late and/or broadcast seeding.

3. Test your soil and follow test recommendations. The rates shown here assume a medium soil test, which may vary considerably from the needs of your field.

4. Use less N if preceding crop was a legume or heavily-fertilized grass, or if field recently received manure.

5. Rates shown assume fall and spring grazing, and a grain crop to be taken.

6. Harvest early for better quality forage; harvest later for more tonnage of lower quality.

7. Plants must be well rooted and fields not muddy when grazed.

8. Wheat joints by mid April in the Lafayette region; no grain will be produced if grazed beyond jointing.

9. Rye grows more rapidly and becomes stemmy early, so graze heavily to keep growth short and palatable.

Harvesting for Silage

Better quality silage is produced when small grains are cut in the boot or early head stage of growth. However, yields are greater if harvest is delayed through the milk stage. Since quality is a more critical factor in dairy operations, consider the earlier cutting for silage to be fed to dairy animals and the later cutting for silage to be fed to beef animals.

Silage should be wilted to 65-70 percent moisture if harvested before the late milk stage of growth.

Harvesting for Hay

The table shows that, for hay production, rye and wheat are harvested at an earlier stage of growth than oats. Oats become stemmy and decrease in quality quickly after heading. Proper timing of harvest for oat hay is more difficult than it is for wheat hay. Regardless of the growth stage at which the crop is cut, a hay conditioner should be used to encourage rapid curing.

Harvesting as Pasture

In Indiana, wheat may be pastured in the fall, but the best time is March and early April. Excessive grazing in the fall increases the chance of winterkill. However, if there is excess fall growth because of high nitrogen applications, or early planting or an extended growing season, removing this growth by fall grazing may be beneficial to grain yields.

If you fall graze wheat, leave a 3-inch stubble height for winter protection. If the wheat seed was treated with a fungicide before seeding, be sure to follow grazing restrictions on the label. In some cases, the forage may not be grazed for 6 weeks after planting.

Well-drained fields are better for pasturing than poorly-drained ones. Remove cattle when fields become too wet to support the weight of the animals. Also, don't graze small grains during winter dormancy.

The time in the spring to remove cattle from wheat to be harvested for grain is when "jointing" is first observed. Every 3-4 days starting in early April, split the stems of several large plants lengthwise. When a small developing head is seen within 1 inch of ground level atop the split stems, that is the time to stop grazing. (Note: Spring-grazed wheat may mature its grain 1-4 days later than if it were not grazed.)

Precautions in Feeding Small Grain Forage

1. Feed dry hay to livestock free choice for a week after turning onto lush small grain pasture to reduce the likelihood of scours or bloat.
2. Remove dairy animals from small grain pasture 2 hours before milking to reduce the problem of off-flavored milk.
3. See grazing restriction under the heading "Harvesting for Pasture."

Forage Potential of Other Small Grains

Barley. The awns of barley make it less desirable than other cereals for hay. Its early growth habits place it in a class with rye for early spring pasture use.

Triticale. Used for pasture or silage, this crop should be managed similar to wheat.

Crosses. Wheat-wheatgrass crosses are grown exclusively for forage (primarily pasture), because they are sterile and produce no grain. In general, manage these products similar to wheat for forage.

Related Publications

Single copies of the following Purdue Extension publications on small grain production are available to Indiana residents from their county extension offices or from the CES Mailing Room, AGAD Building, Purdue University, West Lafayette, Indiana 47907:

- "Performance and Adaptation of Small Grains in Indiana" (SB-151)
- "Small Grain Diseases" (BP-5-18).