



Small Grains, Ryegrass and Clovers for Forage

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Small grain crops are widely used in Tennessee for pasture, silage and hay. These crops produce high-quality forage during the fall, winter and spring. Including ryegrass will result in growth longer into the spring, while adding crimson or arrowleaf clover will decrease the amount of nitrogen that needs to be applied. All of these crops are cool-season annual plants, meaning they germinate in the fall, grow during the fall, winter and spring and then die in the late spring or early summer.

Even though these crops live for only one year, they have potential for use in several ways.

Dairy operations

Annual crops have long been used on dairy farms as a source of high-quality hay or haylage. Small grains have been used as a winter crop on land used for corn silage production during the summer. When harvested at the proper stage of maturity, the nutrient content of wheat or rye makes it an ideal feed for dairy cattle.

During the last several years, the percentage of dairy farmers using small grain pastures as a source of grazing for their cattle has increased. Wheat/crimson clover or rye/ryegrass pastures have been used to decrease the dependence on stored feed. Producers using these pastures have been able to replace between 20 and 50 percent of the dry matter intake that normally would come from silage. This has been accomplished by providing their cows access to small grain pastures for approximately an hour at a time, once or twice a day. The high nutrient content of these pastures allows dairy producers to reduce feed costs without losing milk production.

Beef operations

Backgrounding beef steers and heifers on cool-season annual pasture provides high-quality forage during the fall, winter and spring. Some cattle producers use these pastures as a creep pasture for calves or supplemental feed for cow herds.

Double-cropping

Land that has been used for crop production is often planted with a small grain as a cover crop. The forage from this crop can be easily used by either cutting for hay or silage, or putting up a temporary fence and grazing. Land that has been planted to a summer annual such as pearl millet or sorghum-sudan hybrid for pasture, hay or silage can be planted with a winter annual to provide almost year-round production from this land. Small grains with or without crimson clover mature early and are relatively easy to kill, so they can be produced and harvested in time to plant a crop for summer production. Ryegrass is difficult to kill in late April or early May, and therefore is not generally recommended in the mixture when double-cropped with corn or where wheat will be planted for grain the next fall.

Seasons of growth

Rye — is the most cold-tolerant of the small grains. It provides the most fall grazing, but matures earlier than the other small grains or ryegrass.

Wheat — produces slightly less growth in the fall than rye, but is productive longer into the spring than rye.

Barley and oats — provides late winter and spring forage. Are generally not recommended for fall forage because of damage from barley yellow dwarf virus and winter kill.

Annual ryegrass — provides high-quality forage, with good fall and spring growth. Makes little growth after the first frost until spring. Produces forage later into the spring than any of the small grains. Is excellent in a mixture with wheat or rye because of the late spring growth.

Clovers —these plants provide high-quality and very palatable forage for the winter and spring. There are two annual clovers that can be used in mixtures with small grains and annual ryegrass:

Crimson clover - provides fall and early spring production.

Arrowleaf clover - provides late winter and spring production.

Steps for establishing small grains

1) Land selection — For fall production, select bottomland which stays moist during fall. For spring production, use upland that warms up early in spring.

2) Planting method — Both conventional and no-till methods of planting can be used. Conventional tillage ensures the reduction of competition from existing vegetation. For successful no-till planting, this vegetation must be killed chemically with a burndown herbicide such as Gramoxone Extra® or Roundup®. Seeds should be placed between 1/4 and 1/2 inch deep in the soil. No-till plantings have shown less winterkill than conventional seedings. Using no-till will also provide a firmer base for winter grazing than will conventional planting.

3) Planting dates — For fall production, seedings should be made early. Plantings made after October 1 usually produce little fall growth. Because of damage from barley yellow dwarf virus, wheat, barley and oats should not be planted prior to September 1. Late plantings with oats or barley should be avoided because of the potential for winterkill. Table 1 lists the window of planting dates suggested for establishment of cool-season pasture.

Table 1. Suggested planting dates for cool-season forages.

Species	Aug. 15-31	Sept. 1-15	Sept. 16-30	Oct. 1-15
Rye	✓	✓	✓	✓
Ryegrass	✓	✓	✓	✓
Crimson clover	✓	✓	✓	✓
Arrowleaf clover	✓	✓	✓	✓
Wheat		✓	✓	✓
Oats		✓	✓	✓
Barley		✓	✓	✓

***** Use only in mixtures with rye, wheat or barley after September 15.

4) Seeding rates — Recommended seeding rates are shown in Table 2. If fall grazing is expected from pure stands of wheat or rye, rates should be increased by 50 percent. Check with your local Extension office for recommended varieties. Table 3 provides information needed to convert from bushels to pounds and the number of seed that will be planted for the various cool-season annual crops.

Table 2. Seeding rates for cool-season forages.

Forage crop(s)	Seeding rate (per acre)
Wheat or Rye or Barley or Oats	2-3 bu
Ryegrass	20 lb
Crimson clover	20 lb
Arrowleaf clover	8 lb
Rye or Wheat + Ryegrass	1.5 bu + 15 lb
Rye or Wheat + Ryegrass + Crimson clover	1.5 bu + 15 lb + 10 lb
Rye or Wheat + Ryegrass + Arrowleaf clover	1.5 bu + 15 lb + 4 lb

5) Fertilization — Oftentimes a winter annual pasture will follow a summer crop that received high levels of fertilizer. A soil test should be taken to determine if there is a need for lime, potash or phosphate. Information from a soil test will provide assurance that the establishment and production of the pasture will not be limited by low nutrient levels, or that money is not wasted by excessive application of fertilizer. Small grain and grass pastures are highly responsive to nitrogen fertilizer. Table 4 gives recommended nitrogen fertilization rates for winter annual pastures.

Utilization

Once the winter annual pastures have been established, the forage produced should be used as efficiently as possible. Silage or hay harvest removes the growth with very little waste. Hay or silage harvest should be made at the late-boot stage of growth. At this stage, the head is beginning to emerge from the sheath and the quality of this forage will be high. Harvesting at a later stage may result in slightly higher yields, but the nutrient content of this forage will be reduced. Animals consuming this forage will have a lower nutrient intake and poorer performance than ones supplied forage harvested at the late-boot stage.

Harvesting the forage by grazing generally results in the greatest amount of waste, due to trampling and rejection of forage because of manure. The amount of pasture wasted can be decreased if animals are confined to small areas of the pasture (a paddock), and then rotated to another area when all of the forage in the first paddock has been consumed. Grazing should begin when the forage is approximately 8 inches tall. The animals should be removed when plants are grazed down to about 3 inches. Electric fencing can be used to divide a large pasture into several paddocks, with paddock size adjusted so that a minimum of three to seven days are required to graze it down. After the animals are rotated, the paddock should be clipped to remove any rejected areas that have become mature.

Summary

Small grains and ryegrass provide a producer with the flexibility to either graze high-quality forage during the fall, winter and spring, or cut silage or hay. No matter if planted in 100 acres for silage production, or five acres as a winter supplement to beef cows, the high nutrient content of these forages can provide excellent performance from any group of livestock.

Table 3. Cool-season forage seed information.

Forage species	lb(s) per bushel	Seeds per pound
Rye	56	18,000
Wheat	60	11,000
Oats	32	16,000
Barley	48	14,000
Ryegrass	24	224,000
Crimson clover	----	150,000
Arrowleaf clover	----	400,000

Table 4. Nitrogen fertilizer recommendations for cool-season forages.

Nitrogen recommendation** (lb N/acre)	
For fall and spring grazing (plantings before Oct. 1)	30-60 at seeding
	30-45 March 1-15
	30-45 April 15 May 1, if ryegrass is included
For spring grazing only (plantings after Oct. 1)	30 at seeding
	30-45 March 1-15
	30-45 April 15 May 1, if ryegrass is included

** The lower nitrogen recommendation should be used if clover is included in the mixture.

Precautionary Statement

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store, or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label.

Pesticides recommended in this publication were registered for the prescribed uses when printed. Pesticide registrations are continuously being reviewed. Should registration of a recommended pesticide be canceled, it would no longer be recommended by The University of Tennessee.

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