DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

Agriculture and Natural Resources

FSA3154

# Orchardgrass for Forage

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**Quick Facts about Orchardgrass:**

**Origin:** Introduced from Europe in 1700s

**Growth:** Perennial cool-season grass; clumpy bunch-type growth; good in mixtures with legumes

**Height:** 2-4 feet

**No. seed per lb.:** 416,000

**Uses:** Grazing and hay

- First grazing: Mid-April
- First hay harvest: Early to mid-May
- Hay yield: 2-4 tons/acre per year

**Establishment:**

- Planting date: September to mid-October
- Seeding rate: 10-12 lbs/acre drilled; 12-15 lbs broadcast
- Planting depth: ¼" to ½"

## Description and Uses

Orchardgrass was introduced to the United States from Europe in the 1700s. It was commonly observed growing in orchards and shaded areas, hence the name. Cool-season grass species such as orchardgrass, timothy, smooth bromegrass and redtop were widely grown for hay and pasture in the Midwest before the introduction of tall fescue. It is more drought tolerant than timothy and Kentucky bluegrass, but less tolerant than smooth bromegrass or tall fescue. It is less heat tolerant than tall fescue. It is best suited to well-drained soils and has low persistence in poorly drained or frequently flooded sites.

The optimum temperature for orchardgrass is 70°F; temperatures above 82°F reduce growth. It has a clumpy growth habit, which makes it ideal for growing in mixtures with legumes or other grasses. Most of the annual growth is in spring, but it can provide regrowth for good fall grazing as well. Orchardgrass produces seedheads only on the spring growth.

**Figure 1.** Orchardgrass being cut for hay.

Regrowth after spring grazing or hay harvest is leafy vegetative forage. Pasture and hay quality are very good when harvested at early stages of maturity. It is best adapted to the northern third of Arkansas but can be grown for short one- to two-year rotations in southern areas of the state. Orchardgrass is a popular cool-season grass to plant in mixture with alfalfa or red or white clover.

## Establishment

Orchardgrass is best planted in September to mid-October. Early spring seedings can be successful but may not become developed enough to

**Figure 2.** Orchardgrass regrowth after cutting or grazing is leafy, high quality forage.

withstand summer drought and weed competition, and therefore are not often recommended. Good seedbed preparation and seed placement are important for successful establishment.

For pure stands, plant 10-12 lbs. of good quality seed per acre in a tilled and well-firmed, moist seedbed that has been limed and fertilized according to a soil test. Increase the seeding rate to 12-15 lbs./acre for broadcast plantings. Planting with a no-till drill works well if the existing sod and weed competition are controlled. Application of nonselective herbicides can be used for sod control before no-till planting.

Seed should be planted shallow (1/4- to 1/2-inch deep) and the soil should be firmed around the seed for good seed-to-soil contact. For fall-established stands, grazing or hay harvest can begin the following mid- to late-spring. Spring-established stands might not develop sufficiently for use before summer, so limited grazing or hay harvest may not be feasible until fall. Nitrogen (N) fertilization for establishment should be 30- 40 pounds per acre. P and K fertilizer and lime should be applied according to soil test recommendations.

## Field preparation for planting

*Tilled seedbeds* — Tilled seedbeds should be smooth and free of sod or clods, with a fine crumbly texture. Avoid leaving large tree roots, stumps, holes, and rocks that would later interfere with field maintenance. When converting from other grasses or mixed, unproductive grasses, it is often helpful to kill the existing sod with a nonselective herbicide such as glyphosate prior to tillage. Killing the old sod reduces the amount of tillage necessary to prepare a smooth, clean seedbed. Tilled seedbeds have an advantage in that lime and fertilizer can be tilled into the root zone to more quickly increase soil pH and soil fertility. Seed can be planted by drill or broadcast planted. When broadcast planting, roll or cultipack the tilled field to smooth and firm the seedbed, broadcast the seed, and then roll the field again to cover the seed and ensure good seed/soil contact.

*No-till planting* — When no-till planting, a herbicide is used in place of tillage to kill the old sod and weeds. Fields should already be smooth and free of obstacles. No-till planting is preferred on sloping fields where erosion is a hazard, and on rocky soils. A disadvantage of no-till planting is that lime and fertilizer must be surface-applied and cannot be tilled into the root zone.

*No-till planting into bermudagrass sod* — Research has shown that orchardgrass can be no-till drilled into bermudagrass sod. Stands are relatively short-term, lasting as long as four years, but provide a viable cool-season forage option, depending on conditions and location in the state.

Planting should be done from mid-September to early October in short (2-3 inches tall) sod. For September plantings, it is recommended that the bermudagrass sod be suppressed with a nonselective herbicide, such as glyphosate, or by moderate disking before planting. Graze or cut the bermudagrass to 2-3 inches and allow time for the sod to “green up” before spraying the herbicide. If the bermudagrass is sprayed too soon after mowing there will not be enough green leaf area to absorb the herbicide, resulting in poor suppression.

A glyphosate rate of 1 pint/acre is often sufficient for bermudagrass sod suppression, but some producers have applied as much as 1 quart per acre. Herbicide suppression of the bermudagrass sod in late summer seldom has any long-term negative effect. Bermudagrass stands normally grow back the following spring with no noticeable effect. Sod suppression is less critical when no-till planting in October after night temperatures cool into the 50s.

## Fertility

Fertilizer applications must keep pace with nutrient removal to maintain stand persistence. Under low fertility, stand persistence is poor and most of the yield occurs in spring. Under high fertility, forage yield is better distributed over the season and regrowth after first harvest can be 1/3 to 2/3 of total yield. Good regrowth under high fertility is commonly observed when orchardgrass is grown in mixture with alfalfa.

For spring production, fertilizer should be applied in late winter from mid-February to mid-March. For grazing, N rates of 60 lbs./ac can be applied in Feb-

ruary or March. A second application can be made in early May if additional forage is needed. A fertilizer application in early September can improve growth for fall grazing.

For hay production, higher nitrogen rates are needed and depend on the intended yield goal. Research from Pennsylvania showed an economic optimum nitrogen rate of 250 lbs. N per acre, or about 50 lbs of N per ton of dry matter. University of Arkansas forage tests show that nutrient removal rates (N-P-K) of orchardgrass hay are approximately 45-14-48 per ton of dry matter. Use soil test recommendations as a guide.

## Management for better stand persistence

Orchardgrass has a fibrous root system. Carbohydrate reserves needed for regrowth are stored in the lower leaves, tiller bases, and roots. This characteristic has strong implications for managing persistent stands. Close mowing or continuous short grazing removes much of the tiller bases and severely reduces carbohydrate reserves. This slows regrowth and makes the plants more susceptible to other stresses such as diseases and high temperatures.

Virginia research concluded that cutting orchardgrass to a stubble height of 3 inches resulted in faster and greater regrowth than cutting at a 1-inch height under optimum temperatures. However, under high temperatures, regrowth was poor for both the tall and short mowing heights. This emphasizes the importance of making an early first cutting hay harvest. instead of delaying first cutting until high temperatures occur.

Other Virginia work concluded that in alfalfa/orchardgrass stands, cutting at a 2.5-inch height resulted in the highest hay yield, but also caused a decline of orchardgrass in the stand. Mowing heights of 4 inches were needed in that study to maintain orchardgrass stands in the mixture. These results support traditional observations that orchardgrass stands are damaged more by short grazing or mowing heights during summer than during cooler times of the year.

### Grazing

Orchardgrass does not fare well under continuous grazing. To maintain stands, rotational grazing should be used to prevent livestock from grazing the forage too low and removing the tiller bases.

A study was conducted at Batesville, Arkansas in which orchardgrass was interseeded into bermudagrass pastures. Grazing was rotated twice a week or twice a month. Pastures rotated twice a week had orchardgrass stand percentages of approximately 50 percent for the second and third years, and stands were still almost 40 percent after the fourth year. However, when pastures were only rotated twice a month, stands were slightly higher than 40 percent in the second year and declined to 24 percent by the third year. The longer two-week grazing period allowed animals to continue grazing the orchardgrass down into the tiller bases, thus reducing regrowth and allowing the bermudagrass to outcompete the orchardgrass.

**Figure 3.** Orchardgrass crown that was mowed too short. Short mowing or grazing should be avoided to preserve tiller bases where carbohydrates for regrowth are stored.

### Hay harvest timing

Hay yields of 2-4 tons per acre per year can be achieved. If hay is cut by mid-May, a second, high quality cutting of leafy hay can be expected in June. Orchardgrass is an early-maturing grass, thus the optimum stage of maturity for first hay harvest usually coincides with spring rains and poor hay making weather. Delaying hay harvest until plants become mature causes stands to become thin and clumpy. Late harvest also leaves less available ground cover as summer approaches, which has several negative implications including increased crown and soil temperatures and more invasion of the stand by weeds and summer grasses. Second cutting yields can be reduced by more than 25 percent due to late first cutting harvest.

### Variety selection

Currently, forage variety testing is not conducted by the University of Arkansas. However, some commercially available orchardgrass varieties that have performed well in trials in Kentucky and Tennessee include Endurance, Hallmark, Olathe, Olympia, Persist, Potomac, Rushmore II, and FSG 506. Others may perform as well under certain conditions and can be considered when selecting a variety.

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FSA3154-PD-10-20N