

Production Guide for Oats

Oats are grown in Alabama as a grain crop, as a forage crop (greenchop, ensilage, haying, and grazing), alone or in mixtures with rye and clovers, as a catch-crop for nitrogen, as a crop to control erosion (cover crop), and as a crop to add organic matter to the soil (green manure).

The palatability of oats as a forage, as well as its forage quality, is the best of the small grains. As a result, the performance of animals pastured on oats (or, more commonly, oats in combination with other winter annual grasses or legumes) is outstanding. The main factor that limits the use of oats as a winter annual grazing crop in Alabama is that, in general, oats lack good winter hardiness. But, some varieties are much more winter hardy than others, and cold weather risk is less in the southern, as opposed to the northern, portions of the state.

Adaptability

Although oats may be grown throughout the state, they are best adapted to central and southern Alabama. Oats are less winter hardy than wheat, barley, or rye and will generally suffer yield losses when the temperature falls below 20°F.

Variety Selection

The selection of a variety is an important decision that has consequences for the rest of the growing season. Most Alabama farmers consider yield to be the

most important consideration in selecting varieties. Other characteristics, though, such as disease resistance, winter hardiness, maturity, and straw strength are also important considerations when selecting varieties.

Each year Auburn University agronomists conduct oat variety trials at numerous locations throughout Alabama to determine which varieties are best adapted, which have the highest grain or forage yield, and which have the most desirable characteristics for various purposes. Lists of recommended varieties are compiled annually based on these evaluations.

Additional information on yield, disease resistance, and other characteristics of oat varieties can be found in the annual "Small Grain Variety Report" published by the Alabama Agricultural Experiment Station, Auburn University. Copies of the current report and variety recommendations can be obtained at your county Extension office.

In addition to selecting a good variety, use *good quality, certified seed*. If non-certified seed is used, a seed test should be conducted to make certain the seed is free of weeds and has a good germination level.

Seed Treatment

Fungicide seed treatments are an inexpensive and effective method of protecting seed and seedlings from seed and soil-

borne diseases. Certified seed purchased through a seed distributor is often treated with a fungicide. Seed from local sources often is not treated at all.

A fungicide seed treatment is desirable for use on all seed grown for grain. These fungicides may be formulated for machine application, as drill-box treatments, or both. Machine-applied products are cheaper and provide better protection than comparable drill-box treatments. However, the availability of mechanically treated seed is limited in some areas.

Drill-box treatments can provide good protection from most seed and soil-borne diseases. The real key to performance of drill-box treatments is thorough coverage of the seed with the full label rate of the fungicide.

To obtain good distribution of the fungicide over seed, fill the hopper half full of seed, add half of the required amount of fungicide to the hopper, and thoroughly mix. Then, add the remaining seed and fungicide to the drill-box and mix until all seeds are covered.

Loose smut cannot be controlled with contact fungicides because the fungus develops within the seed rather than on the seed coat. The systemic fungicide carboxin will control the disease. Carboxin is available in drill-box and machine-applied formulations. Machine-applied products containing carboxin are

considered superior to drill-box treatments. For information on currently recommended seed treatments, obtain Circular ANR-458, "IPM For Small Grains."

Planting Dates

The optimum dates for planting oats will depend on the location in the state and the intended use. In general, planting should be completed earlier in the autumn in northern Alabama than in southern Alabama. Oat plants that are at a more advanced growth stage (tillering) are less susceptible to winter kill than plants at the seedling growth stage. Planting at the recommended planting date maximizes the chances of producing a good grain or forage crop and minimizes the chances of total crop loss through winter kill.

Oats planted for use as forage should be planted earlier than those to be harvested as grain. Small grains planted too late often suffer winter damage and do not yield well.

Oats that are planted too early may suffer excessive damage from insects and diseases and may accumulate extra autumn growth that often leads to lodging. If stem elongation and head formation begin in autumn, severe winter kill will usually result. Table 1 lists recommended planting dates.

Seedbed Preparation

Preparation of a smooth, firm, vegetation-free seedbed aids in precise planting and obtaining a good stand. Disking is probably the most common method of seedbed preparation for small grains in Alabama. However, recent studies suggest that some sort of deep tillage before planting may be beneficial, particularly on coastal plain soils.

Chisel-plowing and turn-plowing usually result in 5 to 15 bushels per acre more than disking or no-till and 600 to 1,000 pounds per acre higher forage yields. A paraplow or subsoiler with a 30- to 36-inch shank opening is as effective as chiseling or turning.

Planting Rate And Depth

Planting Rate

The quantity of seed needed per acre varies in different situations. First, seeding rates depend to a great extent on the intended use or uses of the crop. More seed should be used in fields that are to be grazed than in areas where oats are being grown for grain only.

Secondly, the method of planting also influences the quantity of seed needed. The best method for planting oats is with a grain drill or other drill-type planter that allows precise planting. If

the seed are to be broadcast and disked in, increase the seeding rate by 20 percent.

The seeding rate should also be increased with any of the following conditions: late planting, no-till planting, planting into a dry seedbed, or aerial planting.

The recommended planting rate for oats planted for grain is 60 to 90 pounds per acre. The recommended planting rate for oats planted for forage is 90 to 120 pounds per acre. If seeded with ryegrass or clovers, the seeding rate for oats is 60 to 90 pounds per acre.

Planting Depth

Oat seed should be placed in firm contact with enough soil to prevent rapid drying. Seed should be placed at depths of $\frac{3}{4}$ to $1\frac{1}{2}$ inches. Deeper coverage may result in loss of vigor and failure of the seed to produce emerged seedlings.

For uniform depth of coverage, the seedbed should be smooth and the grain drill should be adjusted so that all openers are planting at the same depth. If some openers are planting too deep or shallow, poor seed emergence and poor stands may result in those rows.

Liming And Fertilizing

There is no substitute for soil testing in determining how much

Table 1. Planting Dates Of Oats For Grain And Forage Production In Alabama.

	Region		
	Northern	Central	Southern
Grain only	Sept. 15 - Oct. 15	Sept. 15 - Oct. 15	Oct. 1 - Nov. 1
Grazing plus grain production	Sept. 1 - Sept. 20	Sept. 1 - Oct. 1	Sept. 20 - Oct. 20
Grazing (Prepared Seedbed)	Aug. 25 - Sept. 20	Sept. 1 - Sept. 15	Sept. 15 - Sept. 30
Grazing (Planted In Sod)	Oct. 1 - Oct. 15	Oct. 15 - Oct. 30	Nov. 1 - Nov. 15

lime and fertilizer to apply for oat production. When taking soil samples, avoid atypical areas such as depressions or eroded sites. A good fertilizer recommendation depends on a good soil test.

Liming

Soil acidity (low pH) often reduces the yield of oats in Alabama. This can be easily corrected by liming. The recommended range for oats in Alabama is 5.8 to 6.5.

Any needed lime should be incorporated into the topsoil before planting time.

Nitrogen

For grain production apply 20 pounds of nitrogen (N) per acre at planting or soon after seedling emergence. Apply an additional 60 pounds N per acre in February for oats behind a summer legume and 75 pounds N per acre after a non-legume crop.

When oats are planted behind soybeans or peanuts, the autumn nitrogen application can be omitted. Delaying the February nitrogen application until March may severely reduce yields, especially when oats follow non-legume crops.

Oats to be grazed should receive 100 pounds N per acre, followed by an additional 60 pounds N in late winter. If planted with a winter annual legume, or if sod-seeded in late autumn, 60 pounds N per acre should be applied near planting. With grass and legume mixtures, 60 pounds N may be applied in late winter, depending on whether additional forage is needed.

Comparisons of different nitrogen sources have generally shown little or no difference in effectiveness, provided the application requirements of the source used are met. However, gaseous losses from urea or liquids containing urea can be important under conditions of high temper-

atures, dry soils, high soil pH (7.0 or higher), and where large quantities of plant material cover the soil surface. Under these conditions, ammonium nitrate would be the preferred nitrogen source. To minimize losses, dribble urea nitrogen instead of applying broadcast.

Phosphorus And Potassium

Phosphorus (P) and potassium (K) are important in oat production. Needs vary from field to field, and fertilization with these elements should be based on a soil test.

Magnesium And Sulfur

Available magnesium (Mg) is routinely determined on soil samples received by the Auburn University Soil Testing Laboratory. Where Mg is low and liming is needed, dolomitic lime is recommended. However, on fields that are low in P and high in K and N, problems with grazing cows and sheep are likely, because these circumstances favor Mg-deficiencies in animals. Calcium (Ca) is also supplied by lime and is generally not deficient in areas where there is a suitable soil.

Sulfur (S) may be deficient on sandy soils where little or no S has been applied recently. The application of 10 pounds S per acre in the form of ammonium sulfate, ammonium thiosulfate, or other sulfate is recommended each year to prevent S deficiencies. Up to 20 pounds S per acre may be needed on deep sands to prevent sulfur deficiencies. The best time to apply sulfate sulfur is at topdressing in February.

Micronutrients

Micronutrients are generally available in Alabama soils in adequate amounts for oats production. Therefore, routine applications of micronutrients to oats is not recommended.

Weed Control

Weed control for oats is similar to that for wheat. However, **do not** use the herbicide Hoelon for oats. For specific information on weed control, obtain Circular ANR-458, "IPM For Small Grains."

Diseases

The following are the most common diseases for oats in Alabama:

Barley yellow dwarf, is caused by the same virus that causes yellow dwarf on barley and wheat. The disease is often called red leaf disease because leaves of infected plants become uniformly red from the tips backward. The virus is spread by several kinds of aphids. When infection occurs early in the season, plants are stunted and produce no or few heads. The incidence and severity of this disease may be lessened by postponing seeding until the latter part of the recommended planting period.

Crown rust, caused by the fungus *Puccinia coronata*, is one of the most destructive diseases of oats. It is recognized by flaky red pustules on the leaves, and it is similar to leaf rust of wheat. Because crown rust can develop rapidly when environmental conditions are favorable, it can cause serious yield losses. Varietal resistance is the primary means of control, but fungicides may be effective when rust is severe.

Helminthosporium leaf blotch, caused by the fungus *Drechslera avenae*, attacks both leaves and kernels. Oval, reddish-brown spots (sometimes with a white-gray center) are common symptoms of this disease on seedling leaves. Diseased kernels turn brown at the basal stem. By attacking the leaves, photosynthesis will be reduced, resulting in light and shriveled kernels. This happens also by direct at-

tack of the fungus on the kernels. Crop rotation, variety choice, and fungicide treatment on the seed will reduce this disease.

Loose smut, caused by the fungus *Ustilago avenae*, causes blackened heads similar to that of loose smut of wheat and barley. It is controlled by carboxin seed treatment and resistant varieties. Certified seed must have less than 0.5 percent smut as determined by field inspection.

For more information about these and other diseases, see Circular ANR-631, "Oat Diseases In Alabama," which has color photographs that are useful in identifying disease problems.

Harvesting

Oats should be harvested as soon as the grain moisture content drops to 13 percent. Rain or dew will cause discoloration of the grain and will lessen the marketability of the crop. Combining at high moisture (15 percent) and artificial drying may be warranted if kernel brightness is important.

Drying

If drying is necessary, temperatures no higher than 110° F should be used for oats intended for seed. Oats to be fed can be dried at temperatures up to 200° F. The minimum air flow rates and maximum first-layer depths for in-storage drying are in Table 2.

Table 2. The Maximum Air Flow Rates And Maximum Depth Of First Layer Of In-Storage Drying At Different Moisture Contents.

Moisture Content (%)	Approximate required (cfm/bu)	Air flow depth of first layer ^a (feet)	Maximum static pressure ^b (inches)
20	2.5	6	1.9
18	2.2	7	2.3
16	1.5	8	1.7
14	1.0	10	1.8

^a Depths must be reduced if grain contains fines.

^b Pressures given include 0.25 inch for duct losses.



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Use pesticides **only** according to the directions on the label. Follow all directions, precautions, and restrictions that are listed. Do not use pesticides on plants that are not listed on the label.

The pesticide rates in this publication are recommended **only** if they are registered with the Environmental Protection Agency and the Alabama Department of Agriculture and Industries. If a registration is changed or cancelled, the rate listed here is no longer recommended. Before you apply any pesticide, check with your county Extension agent for the latest information.

Trade names are used **only** to give specific information. The Alabama Cooperative Extension System does not endorse or guarantee any product and does not recommend one product instead of another that might be similar.

For more information, call your county Extension office. Look in your telephone directory under your county's name to find the number.

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