KEYS TO PROFITABLE PRODUCTION

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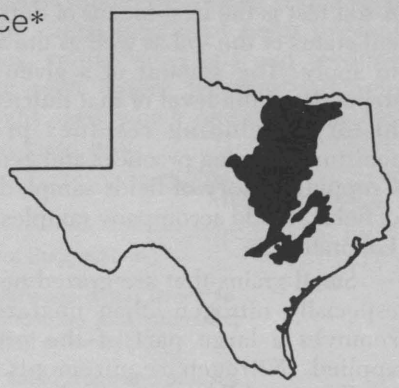
KEYS TO PROFITABLE SMALL GRAIN PRODUCTION IN NORTH CENTRAL TEXAS

Joe E. Cole, George D. Alston and C. O. Spence*



Soil and Climatic Conditions

Small grains are well adapted to the climate and soils of North Central Texas. Most small grains are fall-sown, because spring-sown grain usually encounters hot, dry weather and yields less. Farmers in the northern part of this area should plant varieties that can withstand wide fluctuations in winter temperatures. Oats have long been the major small grain in the southern part of the area and continue to be used heavily for grazing and grain production. Oats are less winter hardy than wheat. Damage to oats from low temperatures occurs about one year in seven. This damage ranges from minor leaf injury to complete destruction of the crop. The degree of cold injury is influenced by the variety used, hardening of the plants, condition of seedbed, root development, available moisture and fertility.

Barley also is less winter hardy than wheat, but if properly managed can give profitable returns from winter pasture and grain. Soils should have adequate surface drainage to permit normal growth and root development to avoid severe damage to the crop by grazing livestock. Rye is the most hardy cereal and produces some forage for grazing during the coldest winter months when other small grains cease growth.

Rotations

Growing small grains repeatedly on the same land may increase damage from winter mites and soil-borne diseases. Small grains grown in sequence with other crops generally result in more stable production. Maximum profits usually result when fertilizer and crop rotations are used in combination.

However, research at the former Texas A&M University Agricultural Research Station, Denton, revealed that planting continuous wheat over a 6-year period yielded more than wheat in a 2-year rotation of grain sorghum and wheat, both with and without a fertilizer application of 40-40-0. The fertilizer treatment significantly increased wheat yields in both cropping systems.

Research at the Texas A&M University Agricultural Research Center at McGregor showed that a cropping sequence of sorghum, oats and cotton is the most productive. This rotation fits well into the economy of the area and often is used by area farmers. Other possible rotations are: (1) 2-year rotation of small grain and cotton; or (2) 2-year rotation of small grain with corn, grain, forage sorghum or sudan.

Seedbed Preparation

Methods vary with the area, the previous crop and soil type, but a smooth firm seedbed is most desirable. Seedbed preparation should: allow rainfall penetration and conservation; provide for easy weed control before planting; help control wind and water erosion; and prevent excessive undecomposed organic material in the seed zone near planting time. To help control erosion on land fallowed after a crop, use minimum tillage for weed control, water penetration and destruction of crop residue.

Quality Seed

Use good quality certified seed of a recommended variety. Planting seed should be plump, true to variety, have high germination and be free from other crop seed, weed seed and trash. Trash in planting seed affects drill operations, causing poor seed distribution and uneven stands.

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Quality seed can be made available at minimum cost by annually seeding a small acreage to foundation, registered or certified seed and saving seed from this crop to seed the next year's acreage. Proper cleaning and seed treatments plus germination testing before seeding help insure good stands.

For information on varieties adapted to your area, see the local county Extension agent.

Fertilization

Base fertilization programs on long-time averages. A soil test is the best means of determining the nutrient status of the soil as well as the amount of fertilizer to apply. The amount of a given nutrient to apply depends on the level of that nutrient in the soil, crop history (including residues present), available moisture, grazing practices and general management. Cropping history of fields sampled, and planned use of fields should accompany samples to the Soil Testing Laboratory.

Small grains that are grazed need more fertilizer, especially nitrogen, than ungrazed grain. Grazing removes a large part of the nitrogen previously applied. Nitrogen requirements are higher when small grains follow grain sorghum and other high residue crops.

Half the nitrogen and all the phosphorus should be incorporated into the soil before seeding. A more efficient method of applying phosphate on clay soils is to use a combination type drill and apply all the phosphate with the seed at planting. Additional nitrogen can be topdressed after grazing or as needed, depending on moisture conditions. If nitrogen and potassium rates at planting are above 15 pounds per acre for wheat, rye and barley and 30 pounds for oats, do not apply directly in the seed furrow. Because available phosphorus in the immediate root zone is so important, it should be applied with the seed. This practice often increases yield, fall growth and cold tolerance, especially on soils low in this nutrient. Phosphorus aids winter hardiness by increasing seedling vigor and by promoting an extensive root system.

In the absence of soil test information, the following fertilizer rates are suggested:

Management	Pounds per Acre		
	N*	P_2O_5	K_2O**
Grazing plus grain	80-120	40-60	0-30
Grain only	40-60	30-40	0-30

*Apply up to half near planting time and topdress remainder in February or March. Use higher rates on sandy soils.
**Apply potash on sandy soils or when experience or soil test indicates a need.

Seed Dates and Rates

Suggested seeding dates for grain and forage production range from early September to mid-October. For grain production only, seeding dates may vary from October 15 in the northern part of the area to November 15 in the southern portion.

Heavy seeding rates do not appreciably increase forage yields under dryland conditions; however, early forage production is favored to some extent by heavy seeding rates. The following seeding rates are suggested:

Crop	Seed per Acre
Wheat	60-75 lb.
Oats	64-80 lb.
Barley	72 lb.
Rye	72 lb.

Weed Control

Weeds are controlled by preventive, mechanical and chemical methods.

Preventive. The use of weed-free seed is important. The combine should be cleaned before harvesting in an uninfested field. Rogue out a light weed infestation to prevent gradual build-up of weed seed in the field. Crop rotation is useful if weed control measures are effective in the previous crops. Adjust planting dates so that control measures can be used before planting. Grazing management can also reduce the vigor and seed production of palatable weeds.

Mechanical. Seedbed preparation and shallow tillage are effective means of destroying weed stands before planting.

Chemical. Refer to product labels for complete information on herbicide application.

Broadleaf Weeds: In wheat, oats, barley and rye from the 3- to 4-leaf stage to before the boot stage, use either bromoxynil-Buctril® or MCPA® amine or ester up to 0.5 lb./A acid equivalent. Do not use MCPA in rye. Bromanil® or Bronate® (MCPA + bromoxynil) at 1 to 1½ pt./A can be used in wheat and barley. Bromanil and Bronate are effective for wild buckwheat and other species.

From the tiller to early-boot stage of wheat, oats, barley and rye, use either 2,4-D or MCPA amine or ester up to 1.5 lb./A acid equivalent. Either dicamba-Banvel® at ¼ pt./A, or dicamba + MCPA-Mondak® at 0.8 to 1.2 pt./A, can be used in fall-seeded wheat immediately after winter dormancy but before the joint growth stage. Banvel at ¼ pt./A can be used in barley and oats. Tank mixtures of dicamba + 2,4-D, or dicamba + MCPA, can be used in fall-seeded barley, oats and wheat.

From the dough stage to harvest, use 2,4-D amine at up to 1.5 lb./A acid equivalent in wheat, oats and barley, or 2,4-D ester at up to 1.0 lb./A in wheat, oats, barley and rye.

Wild Oats: Barban®-Carbyne® at 2 to 3 pints in 5 gallons of water per acre controls wild oats in the 1½- to 2-leaf stage in wheat and barley. To control wild

oats at the 3-leaf stage in barley and fall-seeded wheat, use Difenzoquat®-Avenge® at 2½ to 4 pt./A.

Wild Oats and Broadleaf Weeds: Difenzoquat-Avenge can be tank mixed with either MCPA amine, bromoxynil-Buctril or Bromanil, or bromoxynil + MCPA or Bronate for weed control in wheat and barley. The treatment is made when the crops are in the 3- to 4-leaf stage and the wild oats are in the 3-leaf stage. Refer to product label for specific rates of the tank mix combinations.

Insect Control

Certain conditions favor insect and mite damage to small grains in North Central Texas. Rotation with unrelated crops and destruction of volunteer grain help prevent damaging aphid and mite populations. The fall armyworm frequently damages young small grains, and chemical control may be necessary. Soil insects also may cause damage in certain areas. For additional information see MP-339, *Texas Guide for Controlling Insects on Grain and Forage Crops*, and L-819, *Greenbugs on Sorghum and Small Grains*, (Texas Agricultural Extension Service).

Diseases

All small grain seed should be treated with a seed protectant fungicide. Seed treatment helps prevent seed-borne diseases, smuts, seed rots and seedling diseases. Cleaning seed before treating will help eliminate lightweight seed which often contain disease organisms and yield less.

Disease	Source of Infection	Control Suggestions
Leaf and stem rust	Air-borne spores	Use resistant varieties when available. Experimental fungicides look promising for leaf rust control on wheat.
Foot rot, root rot, crown rot, Septoria and other leaf spots	Crop residue, soil, air-borne and seed-borne spores	Rotate with unrelated crops and practice good crop residue management. Treat seed with protectant fungicide.
Loose smut of wheat and barley	Infected planting seed. Infection takes place at heading time and infected seed appear the same as those uninfected.	Use seed free of loose smut infection. Treat seed with Vitavax®.
Loose smut of oats	Spores on seed coat	Loose smut of oats is not systematically seed-borne as in wheat and barley. Use seed protectant fungicides.
Other smuts	Spores may be on seed or in soil.	Use protectant fungicide as seed treatment.
Wheat streak mosaic	Virus is transmitted by the wheat leaf curl mite.	Destroy volunteer wheat. Avoid early planting where this disease is a problem.
Yellow dwarf	Virus is transmitted by aphids	Control aphids and use varieties that show less damage when infected.
Seed rots and seedling diseases	Seed- and soil-borne spores	Use seed protectant fungicides: Captan, Maneb, PCNB, Phenyl, Mercury, Polyram, Thiram, or Zineb.
Powdery Mildew	Air-borne spores	Plant resistant varieties.

Grazing Practices

Wheat, oats, barley and rye usually provide green forage for livestock during late fall, winter and early spring. Oats and wheat are the main cereal crops for grazing in this area. Although mixtures are used, they usually do not produce more forage than a single variety. Mixtures can be used to lengthen the production period (example: wheat and oats). These are best seeded in separate fields but may be seeded as a mixture. Returns from grazing small grains sometimes exceed the grain value. Controlled grazing may not seriously reduce grain yield, and the value of the forage may more than offset any losses in grain production, provided grazing ceases at the proper time. Growth of small grains stops at 40 degrees F, and rank, succulent plants are easily damaged by low temperatures. Properly controlled grazing may reduce low temperature damage and save the crop for grain.

Very young small grain plants are damaged by severe defoliation. Delay grazing until the plants are well established. Stocking rate should be light enough to avoid continuous complete removal of top growth. If a grain crop is desired in the North Central Texas

area, remove livestock before plants begin to joint. Late spring pasturing can reduce grain yields severely. Barley and rye are earlier in heading than wheat or oats, and may be injured more by late grazing. Kansas research revealed that grazing wheat delayed maturing 1 to 4 days. The more closely wheat was grazed, the later it matured.

Grazing grain on clay soils that are extremely wet may cause soil compaction. Grazing may be harmful on sandy soils by removing top growth and exposing the soil to wind erosion. Thin stands also may be damaged by livestock trampling and pulling the plants out. Do not graze all of the top growth — leave some to hold the soil and provide plant protection.

Harvesting

Begin harvesting when the moisture content of the grain has been reduced to 12 to 13 percent. Proper combine adjustment will reduce harvest losses to a minimum. Wheat varieties vary considerably in tightness of chaff and ease of threshing. Oats have much weaker straw than wheat or barley, and sometimes present additional harvesting problems. Storms, wind and rain may cause severe lodging of oats, which increases the cost of harvesting and may reduce grain quality. Where lodging or shattering threatens to occur in an oat crop, or where weeds are a problem, or if the grain ripens unevenly, windrowing and use of a pickup attachment to combine the crop may be advisable. An oat crop usually is damaged less by rains when in the windrow than if it is standing full ripe.

Oats in the soft dough stage of growth may be used for ensilage. A good oat crop yields 6 to 10 tons of silage and can be made into silage earlier than other crops. Oats also make a valuable hay crop if harvested when the leaves and stems are green and the grain is in the soft dough stage. Oat straw is the most palatable and nutritious of cereal straws.

Spring Seeding of Small Grains

Spring seeding of wheat and barley is usually not recommended because yields have been much lower than from fall-seeded varieties. Spring-seeded crops usually are established during a period of low rainfall, cool temperatures, high winds and spring freezes. When the fall-seeded crop is winter-killed, spring seeding may be substituted. Where spring establishment of wheat is feasible, the day neutral spring wheats are recommended.

Grain Marketing

Grain producers can coordinate marketing and production activities to enhance their profit potential. Growers should produce the grade and class of grain that will meet the needs of the market. Local flour mills and the export market are the main market outlets for wheat grown in this area. Barley and oats are used primarily for seed or for livestock feed. Producers should pay particular attention to the decision to produce "hard" or "soft" wheat, because price discounts on soft wheat have been relatively higher in recent years. The larger yields on soft wheat varieties will have to be evaluated against the lower relative price received. Also, protein content of wheat is an important pricing factor.

Producers, acting individually or as a group, may select one or a combination of the following alternatives for marketing their grain: (1) deliver and sell the crop at harvest to a local elevator or directly to a terminal market; (2) contract the crop at a prearranged cash price before harvest; (3) "hedge" the crop before harvest on the futures market, then liquidate the "hedge" at harvest and deliver the grain to a local buyer for cash; or (4) store the harvested crop on-farm or in a commercial elevator for later cash sale. Although it has not been done often in the last few years, farmers also can apply for a government loan on grain that is in an approved warehouse facility. Producers can redeem the loan when market prices are favorable, or let the government take title at the loan price. Another alternative is to market grain and/or forage production through livestock.

The producer can sell grain in one lot or he can try to achieve more of an average price by marketing in several smaller lots throughout the year. Local storage facilities are limited and grain (especially wheat) may have to move to a terminal market for extended storage. If storage is considered, estimated shrinkage, handling and interest costs should be analyzed for future profitability.

A thorough understanding of how to use these marketing techniques is essential to making sound marketing decisions. Producers should compare expected prices from different alternatives. Up-to-date market information on demand and supply prospects from reliable sources should help in this analysis. Of course, special marketing problems can occur due to weather patterns within the area. These will have implications for forward pricing decisions.

Economics of Production

See current budgets or obtain information from your local county Extension agent. Also refer to L-870A, *Economics of Small Grain Production in North Central Texas* (Texas Agricultural Extension Service).

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