

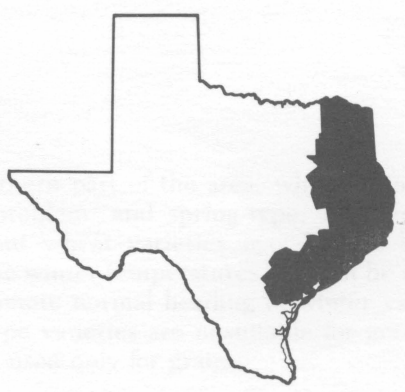
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KEYS

TO PROFITABLE PRODUCTION

KEYS TO PROFITABLE SMALL GRAIN PRODUCTION IN EAST TEXAS AND COAST PRAIRIE



CONTENTS

Soil and Climatic Conditions	3
Rotations	3
Seedbed Preparation	3
Small Grain Varieties	4
Quality Seed	4
Fertilization	4
Seeding Rates	5
Weed Control	5
Insect Control	5
Grazing Practices	5
Diseases	6
Harvesting and Storage	6
Grain Marketing	7
Economics	7

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KEYS TO PROFITABLE SMALL GRAIN PRODUCTION IN EAST TEXAS AND COAST PRAIRIE

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Soil and Climatic Conditions

Most small grain acreage in this area is sown exclusively for grazing. Although grain has been produced successfully in the area, climatic conditions generally are more favorable for forage than for grain production. Rainfall ranges from about 29 inches per year to more than 50 inches. Conditions are ideal for diseases, especially leaf and stem rust, powdery mildew and septoria, all of which are often severe. Wet field conditions may prevent early-fall seeding, and rains during May and June sometimes cause harvesting difficulties. Most small grains are fall-sown. Where grain is produced, fall-sown grains usually out-produce spring-sown grain and also provide winter forage. In the Northern part of the area use cold-hardy varieties that can tolerate wide fluctuations in winter temperatures.

Area growers must understand that selecting varieties with as much disease resistance as possible is extremely important for successful grain or forage production. High moisture conditions from rainfall, fog or heavy night dew cause small grain production to be a high risk enterprise in this area. Experiment stations and area farmers have produced successful grain yield but total failures in the southern part of the area are common.

Soils should have adequate surface and internal drainage to permit normal growth and root development and to avoid severe crop damage by grazing livestock. Internal drainage problems in some flat-wood areas of the Coast Prairie prevent successful small grain forage production. Many East Texas soils need and respond favorably to heavy fertilizer applications.

In the southern part of the area, winterkilling is not a major problem, and spring-type, non-hardy, disease-resistant wheat varieties may be the best choices because winter temperatures may not be cold enough to promote normal heading of winter varieties. Spring-type varieties are unsuitable for grazing and should be used only for grain.

Rotations

Growing small grains repeatedly on the same land increases danger of winter grain mites and soilborne diseases. Utilizing small grains in rotation with other crops generally results in more stable production. Maximum profits occur when fertilizer and crop rotations are utilized in combination.

Rotations including small grains are sometimes useful in accommodating tillage practices that assist in johnsongrass control. Double cropping of wheat and soybeans has been successful in the northeastern part of the area and offers potential to other area soybean farmers. Select an early maturing soybean variety so that seeding of small grains will not be delayed until too late in the fall. Develop beneficial rotations for local situations. Consider herbicide use in planning a rotation as some residues may damage succeeding crops.

Seedbed Preparation

A good seedbed is the first step in obtaining a uniform small grain stand. Prepare the soil early for a firm, weed-free seedbed. Soil tilth and weed control are important and can be improved with sweeps or light disking with an offset or tandem disk.

The seedbed should be firm and smooth. Important considerations are:

- Proper preparation depth to allow penetration and conservation of rainfall

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- Weed control before planting
- Avoidance of excessive undecomposed organic material in seed zone near planting time

To control erosion on fallowed land, provide minimum tillage for weed control, water penetration and destruction of crop residue.

Small Grain Varieties

Wheat and oats are the main small grains utilized in East Texas and the Coast Prairie. In the northern part of the area, only winter wheats and cold-tolerant oat varieties should be grown. Hard red winter wheats generally are accepted by the market, but soft red winter wheats often are discounted in some areas. Determine market acceptance before planting soft wheats. From Beaumont south, three wheat types are available if a farmer decides to risk producing grain. These types are winter wheats, day-length sensitive (long day) spring wheats and day-length insensitive (day-neutral) spring wheats. Hard and soft grain varieties exist in each type. Plant only winter varieties if grazing is desired as the spring varieties do not recover well after grazing.

Area seeding dates for winter wheats and cold-tolerant oats range from approximately September 1 in the north to November 15 in the south. Cool weather in early fall permits earlier seeding some years. If grazing is not a concern, seeding after October 15 in Northeast Texas reduces disease buildup. Winter wheats and oats can be grazed during late fall and early spring without severe grain yield loss if top-dressed with nitrogen before jointing and if moisture is adequate. If a grain crop is desired, stop grazing before jointing or yields will be reduced severely.

Heading of day-length sensitive spring wheat (long day wheat) varieties is controlled by day length. Examples of this type are the Era and Nadadores 63 varieties. Heads are initiated by long days and heading dates may be as late as winter wheat varieties. Seed day-length sensitive wheats from November 1 to mid-December in the area from Beaumont south. Grazing may reduce yields of these varieties, but limited early grazing may be possible on the long-day varieties.

Day length does not control heading of day-length insensitive wheats, also known as Mexican wheats or day-neutral wheats. With optimum temperature, these wheats grow rapidly, head early and are susceptible to frost damage if seeded too early. Thus, seed day-length insensitive varieties after December 20 and before January 15. The day-neutral spring wheats do not recover well from grazing; seed these only for grain production.

Oats generally is utilized for grazing, and seeding dates from September through October are suggested. Base varietal selection on forage yields and

resistance to crown and stem rust which is a requirement for successful forage production in this area.

Barley has not been a major crop in the area. Lack of adapted varieties in the south and lack of market demand contribute to the low barley acreage. In the northern and northwestern parts of the area, barley is adapted and produced successfully.

Rye generally is restricted to deep sands of East Texas where it is used as a cover crop and for grazing.

Some triticale varieties with intermediate growth habit are promising for forage production. Grain production of triticale has not been equal to that of other small grains in most tests in this area.

Quality Seed

Use good quality, preferably certified, seed of a recommended variety. Percent germination and mixtures of other crops are not included in certification standards; therefore, the grower must read the analysis tag to determine if the seed quality meets his needs. Planting seed should be plump; true to variety; have high germination and be free from other crops, weed seed and trash. Trash in planting seed affects drill operation, causing poor seed distribution and uneven stands.

In drier parts of this area, quality seed are possible at minimum cost by annually planting a small acreage to foundation, registered or certified seed and saving seed from this crop for next year. Such planting seed should be free of noxious weeds. Proper cleaning, storage and seed treatments, plus a germination test before seeding, help insure good stands. If a grower is not equipped to produce high quality seed, investing in high quality seed from a reputable seedsman is the first step in successful small grain production.

Ask the county agents for information regarding varieties adapted to the area.

Fertilization

Base fertilization programs on longtime averages, not on the past year's production performance alone. A soil test is the best means of determining the nutrient status of the soil as well as the amount of fertilizer needed. The amount of a given nutrient to apply depends on the level of that nutrient in the soil, crop history including residues, available moisture, grazing practices and general management. Send information about the cropping history of fields sampled, grazing management to be followed and an indication of whether or not grain is to be harvested along with the soil samples to the Soil Testing Laboratory.

Small grain crops used for grain and forage need more fertilizer than those produced for grain only since the forage removed contains a large part of the nitrogen applied initially. Nitrogen requirements are

higher when small grains follow high-residue crops such as grain sorghum. Apply heavy fertilizer rates to maximize forage production if grain production is not desired. However, avoid extremely high fertilizer rates if grain is to be produced or the crop will grow too tall and lodge severely.

Apply about half the nitrogen and all the phosphorus and potassium before or at seeding time. Topdress with additional nitrogen following grazing, depending on moisture conditions. Do not apply more than 15 pounds per acre of nitrogen and potassium for wheat, rye and barley or 30 pounds for oats directly in the seed furrow. Applying phosphorus with the seed often increases yield, fall growth and cold tolerance, especially on soils low in this nutrient. Phosphorus aids winter-hardiness by increasing seedling vigor and promoting development of an extensive root system.

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

Management	Lb. per acre		
	N*	P ₂ O ₅	K ₂ O**
Grazing plus grain	80-150	30-50	0-50
Grazing only	100-175	40-80	0-80
Grain only	40-90	30-40	0-40

*Apply up to one half of the nitrogen near planting and topdress remainder in February or March. Use the higher rates on sandy soils and under grazing only.

**Use potash on sandy soils only or if experience or soil test indicates a need.

Seeding Rates

Neither heavy seeding rates nor narrow row spacing appreciably increase total forage yields under dryland conditions. However, early forage production is favored some by heavier seeding rates. On this basis, the following seeding rates are suggested for grain and forage production:

Crop	Lb. seed per acre*
Wheat	60-100
Oats	64-96
Barley	72-100
Rye	80-100

*Use the heavier rates for forage production.

Weed Control

Control weeds by preventive, mechanical and chemical methods.

Preventive. Use weed-free seed. Clean the combine before harvesting in an uninfested field. Rogue out a light weed infestation to prevent gradual weed seed build-up in the field. Crop rotations can be utilized effectively for controlling weeds. Adjust

planting dates so control measures can be used before planting. Grazing management also reduces the vigor and seed production of palatable weeds.

Mechanical. Proper seedbed preparation and shallow tillage are effective in destroying weed stands before planting.

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

For further information obtain a copy of MP-1059D *Suggestions of Weed Control with Chemicals — Small Grains — Winter Wheat, Barley, Oats and Rye* from your county Extension agent.

Insect Control

Several aphids will infest small grains. The greenbug is the major small grain pest, and damaging populations frequently develop; however, an individual producer may not need to apply control measures for greenbugs annually. Sorghum, johnsongrass, wheat and other small grains provide the greenbug with a host throughout most of the year.

Other aphids found on wheat include the oat bird-cherry aphid and the corn leaf aphid. Generally these aphids do not cause economic damage.

Foliage feeders, such as fall armyworms and armyworms, can destroy seedling stands when weather conditions are extremely favorable for these pests. Damage usually is heaviest in fields planted early for grazing. Armyworm or fall armyworm infestations also occur in the spring following a mild winter and before grains mature to the hard dough stage. This can result in severely reduced yields.

For further information concerning small grain pests and control measures see MP-339 *Texas Guide for Controlling Insects on Grain and Forage Crops* and L-819 *Greenbugs on Sorghum and Small Grains* available from the local county Extension office.

Grazing Practices

Wheat, oats, barley, rye and triticale usually provide green forage for livestock during late fall, winter and early spring. Early seeding is necessary for early forage production. Oats is the predominant cereal crop used for grazing in the area. Mixtures are sometimes considered but usually do not produce more forage than a single variety. They are sometimes used to lengthen the production period (example: a 50:50 mixture of an early and late variety). They are best seeded in separate fields but may be seeded as a mixture. No single variety excels throughout the entire growing season. Distribution of forage production can be improved greatly by seeding two or more varieties with different production patterns in separate fields. Separately managed fields of early and late forage varieties usually provide more forage than a mixture of the two. Growth of all small grains essentially



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stops at 40° F., and rank, succulent plants are easily damaged by low temperatures.

Severe defoliation of very young small grain plants may drastically reduce growth and retard root development. Stands of young small grain plants that are not well rooted may be damaged by livestock pulling them up. Delay grazing until plants are well established (4 to 6 inches high); for maximum yields, delay grazing until plants are 6 to 8 inches high. Adjust stocking rate to permit moderate grazing by maintaining a visual forage surplus of 25 to 30 percent. If a grain crop is desired, suggested date for removing livestock varies, but is not later than February 1 in the south and February 15 in the northern part of the area. To avoid severe injury by spring grazing, remove livestock before the plants begin to joint and the growing point (beginning to develop into a head) gets far enough above the ground level to be removed by grazing. The initiation of jointing varies among varieties and also is influenced strongly by environmental factors. Thus, proper grazing "take-off" time may differ considerably from year to year at any location depending on the variety chosen and seasonal conditions. Periodic examination of small grain plants as take-off time approaches is the best way to determine when jointing begins. Intact plants are pulled up and the stems of individual tillers are split with a sharp knife. Before jointing, only leafy tissue is observed within the split tiller. When jointing starts, a pithy or hollow stem 1/4 to 1/2 inch long is visible in the center of the split tiller, slightly above ground level. Just above the developing "stem," a tiny head or panicle

takes shape. As the stem elongates, the new head is pushed higher. If the developing head is consumed by grazing animals, no grain will be produced. Thus discontinue grazing when "joints" of the stem first begin to elongate to prevent grain yield losses.

Barley and rye head earlier than wheat or oats and may be injured more by late grazing. Spring wheats produce considerable early forage, but when grazed, these varieties do not recover well and grain yields are reduced severely.

Removing topgrowth on sandy soils may lead to excessive wind erosion. Livestock trampling and pulling up plants also may damage thin stands. Leave some of the topgrowth to protect the soil and promote plant regrowth.

Diseases

Treat small grain seed with a seed-protectant fungicide. Seed treatment prevents seedborne diseases, smuts, seed rots and seedling diseases. Cleaning seed before treating helps eliminate lightweight seed which often contain disease organisms and yield less.

Harvesting and Storage

Begin harvest when moisture content of the grain is 12 to 13 percent. Proper combine adjustment reduces harvest losses to a minimum. Wheat varieties vary considerably in tightness of chaff and ease of threshing. Oats has weaker straw than wheat or barley

Disease	Source of infection	Control suggestions
Leaf and stem rust	Airborne spores	Use resistant varieties when available. Experimental fungicides look promising for leaf rust control on wheat.
Foot rot, root rot and crown rot	Crop residue, soil, airborne and seedborne 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 occurs at heading time, and infected seed look the same as healthy seed.	Use seed free of loose smut infection. Treat seed with Vitavax®.
Loose smut on oats	Spores on seed coat	Loose smut of oats is not systemically seedborne as in wheat and barley. Use seed-protectant fungicides.
Bunt and flag smut	Spores may be on seed or in soil.	Use protectant fungicide as seed treatment.
Wheat streak mosaic	Virus is transmitted by 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 showing less damage when infected.
Seed rots and seedling diseases	Seed and soilborne spores	Use seed-protectant fungicides: Captan, Maneb, PCNB Phenyl Mercury, Polyram®, Thiram or Zineb.
Powdery mildew	Airborne spores	The hard wheat varieties have more tolerance than soft varieties.
Septoria leaf and glume blotch	Crop residue, soil and seedborne spores	Deep burial of residue, rotation and seed treatment.

and may present additional harvesting problems. Storms, wind and rain may cause severe lodging of oats, which increases harvesting cost and may reduce grain quality. Where lodging or shattering occurs or threatens to occur, where weeds are a problem or where grain ripens unevenly, it may be desirable to windrow the oats and use a pickup attachment to combine the crop. An oat crop usually is damaged less by rains when in windrows than when standing full ripe.

Oats in the soft dough growth stage may be used for ensilage. A good oat crop yields 6 to 10 tons of silage per acre. Oats can be made into silage earlier in the season than other crops. Oats also makes a valuable hay crop. Cut the crop while the leaves and stems are green and the grain is in the soft dough stage. Oats has the most palatable and nutritious straw of the small grains.

Although not used extensively for hay, barley makes good quality hay if cut at the early dough stage and before the awns become hard.

Safe wheat grain storage is possible if the grain moisture level is less than 13 percent. Thoroughly clean and fumigate storage bins before placing grain in them. Keep area around the storage bin clean. During storage, check grain frequently for heating, insect infestations and rodent damage. Control insects with appropriate bin fumigation. For detailed fumigation information see Extension publication L-217 *Control of Insects in Farm-Stored Grain*.

Grain Marketing

Grain producers can coordinate marketing and production activities to enhance profit potential. Produce the grade and class of grain that will meet market needs. In the southern part of the area, the export market is the main outlet for wheat. This market prefers wheat that grades hard, and soft wheats generally are discounted. Barley and oats are used primarily for seed or livestock feed. Producers should pay particular attention to the decision of producing either "hard" or "soft" wheat because price discounts on soft wheat have been relatively high in recent years. The potentially larger yields of soft wheat varieties must be evaluated against the possible lower price received. Some, but not all, of the so-called Mexican wheats produce grain that is not as hard or vitreous as most hard spring wheat. When milled the grain has

some characteristics of soft wheat. These wheats probably will be graded soft at the market place and the price per bushel will receive a discount.

Producers, acting individually or as a group, may select one or a combination of the following alternatives for marketing their grain:

- Deliver and sell the crop at harvest to a local elevator or directly to a terminal market
- Contract the crop at a prearranged cash price before harvest
- "Hedge" the crop before harvest on futures market, then liquidate the "hedge" at harvest and deliver the grain to a local buyer for cash.
- 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 stored 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, analyze estimated shrinkage, handling and interest costs for future profitability.

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

Economics

See current budgets or obtain information from your local county Extension agent. Also refer to L-893A *Economics of Small Grain Production in East Texas and the Coast Prairie* (Texas Agricultural Extension Service).

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