Rec'd - 6000-2-24-70
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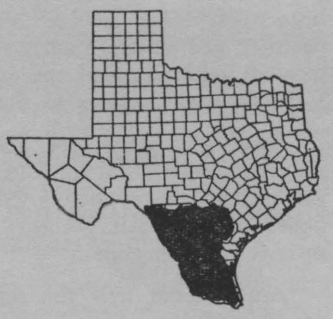
FACT SHEET

L-892

KEYS TO PROFITABLE SMALL GRAIN PRODUCTION IN THE RIO GRANDE PLAIN



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SOIL AND CLIMATIC CONDITIONS

Small grains are adapted to the climate and soils of the Rio Grande Plains. Much of the acreage is seeded exclusively for grazing, but wheat acreage for grain production is increasing. Diseases, especially cereal rusts, usually occur each year. Mild winter temperatures and high humidity, accompanied by frequent heavy night dew, encourage rapid spread of these diseases, which may destroy susceptible varieties. Since winterkilling is not a major problem, spring-type, non-hardy varieties may be grown.

Most small grain acreage is sown to oats, mainly for grazing. Some years, drouth delays stand attainment and affects total production. Small grains respond well to irrigation, although irrigated small grain acreage is small in the area. Rye occupies some acreage on the sandy soils where it is better adapted than other small grains. Soils should have adequate surface drainage to permit normal growth and root development to avoid severe damage to the crop by grazing livestock.

ROTATIONS

Growing small grains repeatedly on the same land may increase some insect and soil-borne disease problems. Growing small grains in sequence with other crops generally results in more stable production. Maximum profits occur more often when fertilizer and crop rotations are utilized together.

SEEDBED PREPARATION

The seedbed should be smooth and firm. Important considerations are: (1) proper depth of preparation to allow penetration and conservation of rainfall; (2) weed control before planting; (3) wind and water erosion control; (4) prevention of excessive undecomposed organic material in the seed zone near planting time. To aid in control of erosion on land fallowed following a crop, provide minimum tillage for weed control, water penetration and destruction of crop residue.

*Extension agronomist and coordinator of this fact sheet, which contains contributions by numerous staff members in the College of Agriculture, Texas A&M University.

QUALITY SEED

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

Quality seed is possible at minimum cost by annually planting a small acreage to foundation, registered or certified seed and saving seed from this crop for the next year. Proper cleaning and seed treatments, plus a germination test before seeding, help insure good stands. For information on varieties adapted to your area, see your county agricultural agent.

SEED TREATMENT

Treat all small grain seed with an approved fungicide and an insecticide, if needed. Seedsmen usually treat certified seed with a fungicide. Seed treatment controls some seed-borne diseases and may reduce infection from diseases carried over in crop residue. Seed treatment is good insurance against seedling blights and some smuts. Several effective fungicides with suggested rates follow:

CHEMICAL (TRADE NAMES)	WHEAT, OATS AND BARLEY
Agrox	½ oz. per bu.
Ceresan L	½ oz. per bu.
Ceresan M	½ oz. per bu.
Chipcote 25	¼ oz. per bu.
Chipcote 75	¾ oz. per bu.
Mer Sol 48	¾ oz. per bu.
Ortho LM	¾ oz. per bu.
Panogen 15	¾ oz. per bu.

For production of *planting seed only,* Vitavax seed protectant may be used to control loose smut of barley and loose smut of wheat. Apply 4 ounces of Vitavax to 100 pounds of seed. The material is compatible with the commonly used barley and wheat seed treatments. *Do not treat the seed with Vitavax if the crop is to be sold for grain.*

Texas A&M University • Agricultural Extension Service • John E. Hutchison, Director • College Station

FERTILIZATION

Fertilization programs should be based on long-time averages. A soil test is the best means of determining the nutrient status of the soil, as well as the amount to apply. The amount of a given nutrient to apply depends on the level of that nutrient in the soil, crop history including residue, available moisture, grazing practices and general management. Send cropping history of fields sampled and grazing management to be followed with samples to the Soil Testing Laboratory.

Small grains that are grazed need more fertilizer since forage removed contains a large part of the nitrogen previously applied. Nitrogen requirements are higher when small grains follow high-residue crops, such as grain sorghum.

Apply about half the nitrogen and all the phosphorus and potassium before or at time of seeding. Topdress with additional nitrogen following grazing, depending on moisture conditions. When nitrogen and potassium are applied directly in the seed furrow, rates should not exceed 15 pounds per acre for wheat, rye and barley, and 30 pounds for oats. Applying phosphorus with the seed often increases yield, fall growth and cold tolerance, especially on soils low in this nutrient. Phosphorus increases winterhardiness by promoting seedling vigor and the production of an extensive root system.

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

MANAGEMENT	LB. PER A.		
	N*	P_2O_5	K_2O**
Grazing plus grain	60 - 100	30 - 40	0 - 30
Grazing only	60 - 120	30 - 40	0 - 30
Grain only	40 - 60	30 - 40	0 - 30

*Apply up to half near planting and topdress remainder in February or March. Use the higher rate on sandy soils if moisture is available or under irrigation.

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

SEEDING DATES AND RATES

Suggested seeding dates for grain and forage production range from October 1 to November 15. Do not seed Mexican wheat varieties for grain production before December 15, or they may head so early that they will be damaged by low temperatures. Neither heavy seeding rates nor narrow row spacings 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:

CROP	LB. SEED PER A.
Wheat	60-75
Oats	64-96
Barley	60-72
Rye	60-72

WEED CONTROL

Control weeds during seedbed preparation and with herbicides after grain is established. A good crop rotation and weed-free planting seed greatly reduce the weed problem. Small annual and perennial broadleaved weeds can be controlled with ½-1 pound per acre of 2,4-D amine or ester. Herbicides are more effective when weeds are small. Spray 2,4-D after the grain has tillered, but no later than mid-jointing. Damage from 2,4-D occurs when applied just before and during the boot, heading and flowering stages. Spraying after weeds have competed for soil moisture does not pay. Large weeds that become established in thin stands of small grain can be controlled with 1 pound per acre of 2,4-D applied after the soft dough stage. Because it takes about 2 weeks for 2,4-D to kill large weeds, make applications as early as possible.

Avoid spraying 2,4-D after susceptible crops such as cotton and vegetables have emerged. In regulated counties, users of hormone-type herbicides must comply with the State herbicide law and regulations.

For detailed weed control information see B-1029, *Suggestions for Weed Control with Chemicals.*

DISEASES

DISEASE	SOURCE OF INFECTION	CONTROL SUGGESTIONS
Leaf rust and stem rust	Air-borne spores	Use resistant varieties when available. Experimental fungicides look promising, but are not practical at this time.
Foot rot, root rot, crown rot, septoria, **Helminthosporium,** sp. and other leaf spots	Crop residue in 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 and infected seed appear the same as those uninfected.	Use seed free of loose smut infection. Produce next year's planting seed from Vitavax-treated seed in fields isolated from other wheat or barley.
Other smuts	Spores of fungus may be on seed or in soil.	Use protectant fungicide as seed treatment.
Yellow dwarf	Virus is transmitted by aphids.	Control aphids and use varieties that show less damage when infected.
Powdery mildew	Air-borne spores	Use resistant varieties when available.

INSECT CONTROL

Under certain conditions, insects may seriously damage small grains in the Rio Grande Plain area. The fall armyworm is a bothersome pest and during some years insecticide applications are necessary. Soil insects also may cause damage in local areas. See MP-339, *Texas Guide for Controlling Insects on Grain and Forage Crops.* See L-819, *Greenbugs on Sorghum and Small Grains,* for more information about aphid species on small grains.

GRAZING PRACTICES

Wheat, oats, barley and rye usually provide green forage for livestock during late fall, winter and early spring. Early seeding is necessary for early forage production. Oats are the predominant cereal crop used for grazing in the area. Mixtures are utilized but usually do not produce more forage than a single variety. They can be used to lengthen the production period (example: early and late variety), and to hedge against winterkilling (example: winter and spring variety of oats). They are best seeded in separate fields but may be seeded as a mixture. Barley and rye grow off rapidly in the fall and furnish pasture sooner than other small grains. Growth of small grains essentially stops at 40 degrees F. and rank, succulent plants are easily damaged by low temperatures.

Very young small-grain plants suffer from severe defoliation. Delay grazing until the plants are well established, 8 to 10 inches high, for maximum yields. Stocking rate should be light enough to avoid continuous complete removal of topgrowth. A field should not be grazed down, particularly during the winter months. The stocking rate should be adjusted to permit moderate grazing by maintaining a visual forage surplus of 25 to 30 percent. If a grain crop is desired, suggested date for removal of livestock varies from north to south, but is about February 1. To avoid severe injury by spring grazing, remove livestock before the plants begin to joint and before the growing point, (beginning to develop into a head) gets far enough above the ground level to be removed by grazing. Barley and rye are earlier in heading than wheat or oats and may be injured more by late grazing. The Mexican wheats produce considerable early forage, but when grazed, these varieties do not recover well and grain yields are severely reduced.

Removing topgrowth on sandy soils may lead to excessive wind erosion. Thin stands also may be damaged by livestock trampling and pulling out of plants. Leave some of the topgrowth to protect the soil and promote plant regrowth.

HARVESTING

Harvest should begin when the moisture content of the grain is 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 weaker straw than wheat or barley and may present additional problems in harvesting. 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 occurs or threatens to occur, or where weeds are a problem, or if the 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 the windrow than if 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. Oats can be made into silage earlier in the season than other crops. Oats also make a valuable hay crop. Cut the crop while 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.

Barley makes good-quality hay if cut at the early dough stage and before the awns become hard, although it is not used extensively for hay. Recent increases in cattle feedlot activity should improve market demand for feed barley grown in the state.

GRAIN MARKETING

Grain producers may elect to (1) contract their crop at a given price to a local buyer before harvest, then fulfill the contract by delivering the grain at harvest for cash; (2) "hedge" their growing crop on the futures market, then liquidate the "hedge" at harvest and deliver the grain to a local buyer; (3) deliver and sell their crop at harvest to a local buyer; (4) store their harvested crop on-farm or in a commercial elevator for later cash sale; or (5) place their harvested crop in an approved facility where government loan is available for later cash sale either to a local buyer or by redeeming the loan and delivering title of the grain to government. Others suitably equipped may choose to market all or a portion of their crop for seed purposes.

Each marketing method has advantages and disadvantages. For example, where the producer elects to store grain at his expense for later cash sale, estimated dry matter and moisture shrinkage must be computed, along with storage-handling and interest costs. These costs must be compared with expected future changes in cash prices to determine the profitability of this option.

ECONOMICS OF PRODUCTION

Increased production efficiency is possible by adopting practices proved through research and result demonstrations. Decisions to adopt improved production practices are made by considering added costs versus added returns because of the change in practices. Production practices which affect costs and income most should receive first consideration. Soil fertility, land preparation, insect control, weed control, disease control, variety selection and harvesting greatly influence on the profitability of a small grain crop.

Adequate records and accounts are necessary to determine the profitability of small grain production and to measure and make changes in production practices.

Estimated Yield, Price, Income, Production Costs, Harvesting Costs and Income Over Specified Costs per Acre for Wheat, Oats and Barley

	Wheat	Oats	Barley
Yield—bu. per A.	15	30	20
Price—$ per bu.	1.25	.75	.90
Grazing—3 mo. @ $4/mo.	12.00	12.00	12.00
Income per A.[1]	$30.75	$34.50	$30.00
Preharvest costs per A.			
Seed—(wheat 1 bu., oats 2½ bu., barley 1½ bu.)	$ 2.50	$ 3.75	$ 3.00
Fertilizer—40-30-0	5.50	5.50	5.50
Insecticide	1.00	1.00	1.00
Machinery	1.56	1.56	1.56
Labor	1.11	1.11	1.11
Interest on operating capital 8% for 6 mo.	.47	.52	.49
Total specified preharvest cost per A.	$12.14	$13.44	$12.66
Harvesting costs per A.			
Combining—custom	$ 3.00	$ 3.00	$ 3.00
Hauling—7¢ per bu.	1.05	2.10	1.40
Total specified harvesting cost per A.	$ 4.05	$ 5.10	$ 4.40
Total specified preharvest and harvesting costs	$16.19	$18.54	$17.06
Income over specified costs[2]	$14.56	$15.96	$12.94

Cultural Practices, Usual Dates, Times Over, Hours Per Acre, Cost Per Hour, Cost Per Acre for Wheat, Oats, and Barley

Cultural practice	Usual dates	Times over	Hr. per A. Labor	Hr. per A. Machinery	Cost per hr. Labor	Cost per hr. Machinery	Cost per A. Labor	Cost per A. Machinery
Disk	July-Sept.	2	.44	.4	$1.30	$2.00	$0.57	$0.80
Fertilize	Aug.-Sept.	1	.19	.17	1.30	2.00	.25	.34
Plant	Sept.-Oct.	1	.22	.21	1.30	2.00	.29	.42
Harvest	May-June		Custom					
			.85	.78			$1.11	$1.56

[1]Income does not include any government payments.

[2]Costs do not include unallocated overhead costs such as interest, taxes and insurance on farm real estate and machinery, depreciation on farm buildings and machinery and pickup expense.

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