FACT SHEET

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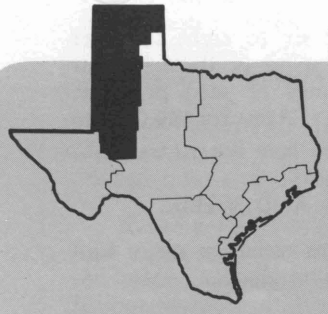

KEYS TO PROFITABLE COTTON PRODUCTION IN THE PANHANDLE-HIGH PLAINS

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FIT COTTON INTO BALANCED FARMING

Make efficient cotton production a part of the overall balanced program of farm operations. This requires greater management skills. Accurate, current farm records are good tools in modern farm management.

TAKE CARE OF YOUR SOIL AND WATER

LAND PREPARATION. A major objective should be the preparation of a well-developed seedbed with maximum conservation of soil and water. Harvest current year's crop as soon as possible and shred stalks immediately after harvest. Shredding high-residue crops permits a more efficient job of plowing under residue, precision planting, weed control, fertilizer application and bed shaping. The operation of six and eight-row sled cultivators or larger on shaped beds would be more efficient. Shred and plow under cotton stalks and boll residues to a minimum depth of 6 inches. This practice hastens residue decomposition and reduces winter carryover of pink bollworms and boll weevils. Chisel, plow or disk early to take advantage of fall rains. Floating or leveling aids water distribution on irrigated land.

FERTILIZATION. Soils in this area generally are low in organic matter and nitrogen and low to high in phosphorus. They are well supplied with potassium, with response limited to very sandy areas.

Yield levels of 1½ to 2 bales per acre usually require about 60 to 80 pounds of nitrogen and 40 to 80 pounds of phosphorus (P_2O_5) if these nutrients are shown to be very low by the soil test. Under irrigation, 20 to 50 pounds of potassium (K_2O) may be needed occasionally on deep sandy soils where low levels are indicated by soil tests. Dryland sandy areas frequently respond profitably from applications of 20 to 30 pounds of nitrogen (N) and 0 to 30 pounds of P_2O_5.

Except for sandy soils, fertilizers may be applied pre-plant. In the sands, about half the nitrogen and all of the phosphorus and potash should be applied preplant, with the remainder of the nitrogen sidedressed at or before the time squares begin to set.

ROTATIONS. Follow a 3-year rotation where possible: cotton, grain sorghum or corn, and small grains or other crops depending on local conditions. Other crops in rotation may include: diverted acres, castors, alfalfa, certain vegetables, hay crops and high-residue forage crops.

Fields with soil-borne disease problems or chemical residues may not be rotated freely. Record these on a map. Livestock on the farm and availability of stock water may also influence rotations.

Use crop residue and manure, when available, to maintain soil structure and add fertility. Cotton gin trash and manure may introduce weed, insect and disease problems into clean fields. Use them only when no risk is involved.

IRRIGATION. Twenty to 24 inches of rainfall, irrigation water and stored moisture normally produce maximum cotton yields. However, good yields are possible with less water by timely applications.

Yield increases and fiber quality have been consistently higher when the first summer irrigation was applied at the first bloom stage and the second irrigation at peak bloom. Another irrigation 15 to 20 days later may increase income enough to offset irrigation cost in years when summer rainfall is low. Apply one irrigation at peak bloom. A pre-plant irrigation should be applied when rainfall during the winter and early spring is light.

Water requirements during the early growth stages are relatively low. Water use increases sharply when the first blooms appear and continues at a high rate reaching a maximum of .25 to .40 inches per day by peak bloom. This amounts to 2½ to 4 inches every 10 days. Water uses remain high during boll development, but decreases when bolls begin to open. Figure 1 describes the normal seasonal water use. Irrigations should coincide with the critical water use periods.

When irrigation water is limited, alternate row irrigation normally increases the irrigating capacity 50 to 75 percent. More acres can be reached during fruiting and boll development when moisture requirements are highest. A yield increase is obtained on more acres with less acre-inches of water. About 85 percent of the harvested bolls normally develop from blooms set during the first 3 weeks of blooming. Adequate water during this period is important.

If water is extremely short, cotton can be planted in skip-row patterns. A two-in and one-out pattern reduces the irrigated acres to a third of the total, which is an irrigation advantage. Irrigations on skip-row cot-

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ton are most productive when applied in the furrow between rows rather than in the skip.

Cotton planted in June will be pushed to reach maturity before frost. The value of irrigating late-planted cotton is questionable. Maturity cannot be accelerated by earlier or additional irrigations. Actually, irrigation will probably delay fruiting and promote vegetative growth. When moisture stress is evident, such as early morning wilting, a light application down alternate furrows may be beneficial.

With economic emphasis on fiber quality, late season irrigation can be costly. Do not irrigate after August 25 in the southern counties. A slightly earlier cut-off date is recommended for late-maturing varieties.

VARIETIES AND PLANTING SEED

Variety selection should be influenced by three attributes: (1) high lint yields, (2) sufficient earliness to insure mature fiber and (3) storm-resistant bolls. Then select those with inherently longer, stronger fibers. Information on performance of varieties is available from the Texas A&M University Agricultural Research and Extension Center, Lubbock and county agent result demonstrations. Stripper varieties such as Lankart, Lockett, Paymaster, Tamcot, Dunn 56C and Stripper Cala's are grown most widely. Lack of storm resistance has limited the acreage of some open-boll varieties such as Stoneville, Deltapine, Coker and Acala 1517.

Plant only high-quality, high-vigor seed that have been properly processed and stored. Avoid use of low-germinating seed with a high, free fatty acid content or seed that have been cracked or mechanically damaged or stored under high moisture conditions. Such seed often contributes to skippy stands under adverse planting conditions. Save planting seed from afternoon harvested cotton. Give careful attention to proper harvesting and ginning to insure maximum seed quality. After delinting and fungicidal treatment, store cotton seed in a cool, dry location.

FOLLOW PRACTICAL MECHANIZATION

PLANTING. The optimum planting date is between May 10 and 25. Because of the relatively short growing season, a lower potential yield can be expected from plantings made after June 1. The last practical date is June 15 to 20. Additional information is in Bulletin 830, *Cotton Production in the Texas High Plains.* Row widths less than 40 inches will contribute to higher yields, but will demand greater management skills from the producer. If possible, plant on shaped beds with precision depth control planting equipment rather than in-the-furrow planting. Advantages of bed planting are: less power requirements; a 3 to 4 degrees higher soil temperature on beds, when compared to furrows; precise control over depth of seed placement with less scatter pattern in the drill; significant increase in speed and capacity; more rapid germination and seedling growth and plant maturity can increase yield about 28 percent. Bed planting also helps post-emergence weed control practices such as use of lateral oiling shoes and the application of DSMA to grass and weeds in young cotton.

PLANTING RATE. Plant six to eight seed per foot of row to provide a final stand of three to four plants per foot, 20 to 24 pounds of seed per acre, depending on the germination. Aim for 40,000 to 50,000 plants per acre.

CONTROL INSECTS, DISEASES AND WEEDS

INSECT CONTROL. Insects often are major limiting factors in profitable cotton production. Most insects can be controlled effectively with properly applied insecticides. Apply insecticides only when field inspections reveal economic levels of damaging insects. Indiscriminate and prolonged use of insecticides is costly and results in unnecessary destruction of beneficial insect parasites and predators and contributes to the development of insecticide resistance in damaging pests. A sound insect control program makes maximum use of natural control agents and cultural control measures as well as judicious insecticide use.

To develop and maintain the most efficient insect control program, each grower should learn how to determine insect infestation levels, recognize damage caused by various insects and base insecticide application decision upon current field situations.

Thrips, aphids and fleahoppers are commonly the major pests during early season. Control of these pests helps insure early fruiting and maturity. Insecticide control decisions are influenced by population level and possible impact on beneficial insects.

Bollworms, tobacco budworms, pink bollworms and boll weevils are the principal insects involved in late season control. Control programs are designed to insure continued fruiting and to protect maturing fruit. Base insecticide selection upon the pests present and maintain application schedules after initiating a late season control program.

For specific insecticide recommendations, see L-508, *Texas Guide for Controlling Cotton Insects in the High Plains, Rolling Plains and Trans-Pecos Areas of Texas.* B-933, *Cotton Insects,* contains detailed information regarding the description, life history and nature of damage of cotton insect pests in the area.

DISEASE CONTROL. Treat seed with one of the following protectant fungicides:

Table 1. Protectant fungicides for cotton seed

Chemical	Oz. per 100 lb. of seed: Machine delinted	Acid delinted
Captan (75%)	2	3
Ceresan L	3	2
Ceresan M	3	2
De Pester MMH	3	2
Ortho LM	3	2
Panogen 15	3	2
PCNB (75%)		
+ Ceresan L		4 + 2
+ Ceresan M		4 + 2
+ Panogen 15		4 + 2
Terracoat L21		12

Seedling disease: Use high-vigor seed. Keep crop residue out of the seedling zone. If seedling disease is a consistent, serious problem, use an in-furrow fungicide at planting time, such as PCNB + Captan, Terraclor Super X, Panterra, Difolatan or Demosan.

Bacterial blight: Use a resistant variety. Use acid-delinted treated seed and rotate with other crops. Avoid excessive rates of nitrogen.

Root-knot nematodes and fusarium wilt: Chemical soil fumigation and use of tolerant varieties, such as Lankburn, Westburn and Paymaster 909, reduces losses from this disease complex. Use these practices only when there is a need.

Verticillium wilt: Symptoms first appear on isolated plants. Yellow sectors appear on leaves of one or more branches with plants wilting. Brown streaks appear in the woody tissue. Plant to assure uniform and adequate stands. Water wisely and avoid excess nitrogen fertilization. Rotate with grass type crops and use resistant varieties such as Acala 1517V, Acala 3080, Gregg 25V or Paymaster 909 where adapted.

WEED CONTROL. Plan a complete season-long weed control program based on the labor, equipment and supervision available on individual farms, in addition to soil type, planting methods, expected weed problems and chemical and application costs. Although chemicals are highly reliable, mechanical cultivation is still beneficial to minimize soil blowing (or erosion) and to control some perennial weeds. Use of herbicides should be planned around each grower's cultural practices. Weed killers are classified into three groups:

Pre-plant — herbicides are applied before planting and usually incorporated with a tandem disk or other implement. These chemicals include Treflan, Planavin and Dacthal, and are conveniently applied in late winter or early spring, utilizing farm labor and equipment that otherwise would be idle. Pre-plant herbicides should be incorporated and soil iisted into beds by early April to accumulate moisture from spring rainfall. Moisture for seed germination will be reduced severely if this practice follows pre-plant irrigations or spring rains. In some instances, herbicides in this group can be applied effectively at planting.

Pre-emergence — herbicides are applied before seedlings emerge, usually on the soil surface at or shortly after planting without incorporation. Effective chemicals in this group include Caparol, Cotoran and Karmex and may be applied in a band, over the row, or broadcast in conjunction with planting or with aerial or ground equipment after planting. Base selection of herbicide and rate on soil texture and weed problems. All of the afore-mentioned chemicals are highly effective on careless weeds.

Post-emergence — herbicide is applied after cotton emerges and is sprayed on the weed foliage. Numerous herbicides and combinations may be applied effectively for control of small annual weeds and suppression of perennial weeds (from root stocks). Caparol or Karmex at low rates (1/4 to 1/3 pounds per acre plus surfactant) gives effective kill of 1 to 2-inch careless weeds. These two herbicides give good residual control at higher application rates. A combination of MSMA with Herban or Cotoran is highly effective on troublesome weeds such as cockleburs. MSMA alone provides excellent control of wooly leaf bursage (lakeweed) and Johnsongrass when the daily air temperature is 70 degrees F or higher.

Herbicidal activity is enhanced by adding a surfactant to the spray solution. The surfactant aids in spreading spray droplets on the leaf surface. An additive, crop oil, improves weed control on older more mature weeds (3 inches or taller). This special oil is not toxic to crop plants and contains an emulsifier to disperse the oil in the water. Most postemergence herbicide treatments are not effective on large, mature weeds or those in drouth stress. Position spray nozzles so that only a minimum amount of the spray strikes the crop plants. See B-1029, *Suggestions for Weed Control with Chemicals.*

HARVEST AND GIN FOR QUALITY LINT

About 98 percent of the Texas crop is machine harvested. Growers generally are well informed and machine harvest efficiently. Close cooperation by growers with the ginner is important. Moisture guidelines should be followed at the time of harvest to take dry, clean cotton to the gin. See MP-297, *Keep Cotton Dry, Loose and Clean.* Harvest cotton when the relative humidity is 60 percent or less. This is associated with 8 to 10 percent seed cotton moisture. Early morning harvesting of wet cotton is the most common error. If damp cotton is stored on the trailer during crowded seasons, it will begin to "sweat" and injure grades and germination of the seed. Cotton maturing well ahead of frost may be treated with harvest-aid chemicals to permit earlier harvest. The chlorate defoliants work well in mature leaf cotton. If harvest is before frost, desiccants, such as Paraquat and Arsenic acid, should be used to prepare cotton for machine stripping. The skill of the operator is important and he should follow the operator's manual. Operators should make use of the "Cotton Harvest Loss Estimator" to determine machine harvesting efficiency. If a conventional stripper is used, equip the trailer with a "wagon top." This saves labor and avoids placing a man in the trailer while stripping. Strippers equipped with green boll separators and baskets will cut the labor of machine stripping about 50 percent.

Cotton gins best at about 6 1/2 to 8 percent moisture content. Excessive moisture or foreign material requires extra gin drying and cleaning that often reduces lint quality.

Bark may be a serious problem in stripper areas if cotton is stripped too soon after application of desiccants or if it is stripped too quickly after frost. Bark is difficult to remove at the gin and samples containing bark will be reduced in grade. The grower should delay harvest until the stalk is dry, perhaps about a week or longer after frost or after applying a desiccant.

MARKET HIGH QUALITY COTTON

Know the value of cotton, obtain grade, staple and fiber instrument values available such as micronaire. Obtain information on sale of specific varieties and qualities for certain areas. Grow the highest quality possible without sacrificing yield. Participate in cotton promotion programs and other events.

Complete information and forms on the CCC Form A (producer) and Form G (cooperative marketing associations) loans on cotton are available from County ASCS offices.

Consideration should be given to block-ginning or one variety ginning to insure marketing of high quality, uniform lint.

ECONOMICS OF PRODUCTION

Increased efficiency, which means lower cost of production, is possible as improved practices are developed by research. Decisions to adopt new practices will be influenced by studying records. The budgets can be used to help analyze added costs versus added returns resulting from a change in practices.

Table 2. Per acre costs and returns—irrigated and dryland

Variable costs operations, times over, materials, etc.	Labor per A. hr.	Labor	Mach. cost	Total cost 625 lb. lint/A Irrigated	Total cost 250 lb. lint/A Dryland
Preharvest					
Shred and disc (1X)	.20	.30	.78	$ 1.08	$ 1.08
Offset plow (1X)	.25	.38	.82	1.20	
Chisel (2/3X)	.20	.30	.87	1.17	
Chisel (1X)	.30	.45	1.31		1.76
Moldboard + packer (1/3X)	.11	.17	.38	.55	
Disc (tandem) (1X)	.20	.30	.60	.90	
Apply herbicide—custom incl. disk (2X) Treflan 1 pt.				5.19	5.19
List (1X)	.25	.38	.75	1.13	1.13
Pre-irrigate (1X) 5 AI.	.60	.90	6.25	7.15	
Fertilize (1X) 60-30-0 - Irr. 20-20-0 - DL.	.27	.41	.60	6.71	4.60
Rolling Cultivator (1X)	.17	.26	.57	.83	.83
Plant (1 1/4X) Irr-25# seed 3.00 DL - 15# seed 1.80	.31	.47	1.44	4.91	3.71
Sandfight (2X)	.10	.15	.23	.38	.38
Cultivate (3X)	.51	.77	1.72	2.49	
(2X)	.34	.51	1.15		1.66
Water furrow (1X)	.17	.26	.60	.86	
Irrigate (2X) 8 AI.	1.20	1.80	10.00	11.80	
Insecticide (1X) custom aerial app. (.33X) custom				2.25	.75
Hail insurance				8.70	5.50
Total pre-harvest cost				$ 57.30	$26.59
Harvest					
Custom stripping & hauling @ 50¢ CWT				12.50	6.25
Ginning, bagging & ties				17.50	8.75
Interest on operating capital @ 8 1/2 % for 8 mo.				4.89	2.18
Total specified costs per acre				92.19	43.77
Total specified costs per pounds of lint				14.8¢	17.5¢
Returns					
Gross returns per acre					
625 lbs. lint @ 16¢				100.00	
988 lbs. seed @ $37.00 Ton				18.28	
250 lbs. lint @ 16¢					40.00
400 lbs. seed @ $37.00 Ton					7.40
Total gross per acre				$118.28	$47.40
Less total specified costs				92.19	43.77
Net return to land & management without price support payments				$ 26.09	$ 3.63
Price support payments @ 16.8¢ per pound on the projected yield of the domestic allotment (65% of the effective allotment)				$105.00	$42.00
Net return to land & management per lb. lint excluding government payments				4.2¢	1.5¢

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