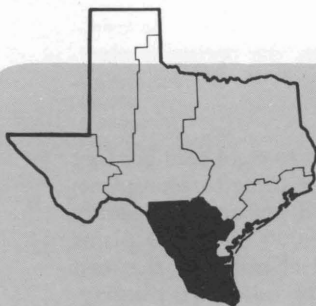


FACT SHEET

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L-887



KEYS TO PROFITABLE COTTON PRODUCTION IN THE LOWER RIO GRANDE PLAIN

Fred C. Elliott*

FIT COTTON INTO BALANCED FARMING

Efficient cotton production demands that the crop be grown on the best adapted soils on the farm. Make it a specification of an overall balanced farm program of operation. Complete, current farm records are a good tool in modern farm management.

TAKE CARE OF YOUR SOIL AND WATER

SOIL AND WATER CONSERVATION. Sloping land should be terraced using applicable graded, bench or parallel types. Graded furrows are suited to some areas. Technical assistance is available through your local Soil and Water Conservation District.

LAND PREPARATION. Harvest the current year's crop as soon as possible and shred stalks immediately after harvest. Meet or, if possible, exceed the cotton plow-up deadline set by the State Pink Bollworm Control Program. Thorough shredding of high-residue crops will make all the succeeding jobs of plowing under residue, precision planting, weed control, fertilizer application, bed shaping and higher speed sled cultivation more efficient. Shred and plow under cotton stalks, boll residues and volunteer cotton to a minimum depth of 6 inches. This practice hastens residue decomposition and reduces or prevents winter carryover of pink bollworm and boll weevils. Chisel, plow or disk early to take advantage of fall rains. Floating or leveling aids water distribution on irrigated land.

Early fall listing or bedding for final seedbed preparation allows time for moisture storage from rainfall or preplant irrigation and for the soil to become firm before planting. Some areas may require rebedding. This is usually not recommended after November. Before last rebedding, apply commercial fertilizer based on a reliable soils test and past experience with fertilizer results.

FERTILIZATION. Soils in this area generally are low in organic matter and nitrogen, and fairly well supplied with potassium. Phosphorus content varies widely. Sandy and sandy loam soils may be low in all three of these nutrients. Dry land areas can utilize about 30 to 50 pounds of nitrogen per acre. No P_2O_5 or K_2O is

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needed on soils containing high levels of these nutrients but rates of 20 to 40 pounds of P_2O_5 and K_2O per acre are suggested depending on soil test levels.

Heavier soils in the irrigated areas of the valley usually have rather high contents of phosphorus and potassium, and responses to these nutrients have not been exceptional. For yield goals of 1 to 2 bales per acre, 60 to 100 pounds of nitrogen per acre are suggested. Twenty-five to fifty pounds per acre of P_2O_5 and K_2O can be applied where soils are medium to low in these nutrients.

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 would include: flax, pasture, grasses, cover crops, diverted acres, oats-clover, certain nonsusceptible vegetables, hay crops and high-residue forage crops. Diverted acres in the rotation also could be planted to clovers, grasses or other soil-building crops.

Known root rot areas and possible residues will affect rotations. Record these on a map. Livestock on the farm and availability of stock water may influence rotations.

Turn under as much organic matter as possible before seedbed preparation to increase water infiltration and reduce cotton root rot. Make maximum use of soil residues. Apply cotton burs at 2 to 6 tons per acre. Use farm and commercial feedlot manure where available.

IRRIGATION AND DRAINAGE. High cotton yields are possible with 20 to 24 inches of water for plant use. This water may be supplied from moisture stored in the root zone, rainfall or irrigation. Efficient, profitable use of water depends upon the amount and when the water is available.

Water use is relatively low until first bloom. Then the rate increases sharply and reaches 0.25 to 0.40 inch per day during early bloom stage. Daily water use remains high through the boll development period and then begins to decrease when most of the bolls are fully developed.

Adequate moisture at planting time helps assure uniform stands and provides water for early season plant growth and root development. Apply enough water with the pre-plant irrigation to wet the root zone to field capacity when rainfall has been low.

Cotton roots may extend to 5 or 6 feet in deep loam and sandy loam soils, but more than 75 percent of the roots grow and function in the top 2 feet. In heavy clay soils, as much as 90 percent of the root activity is in the top foot of soil. Most of the plant's water will be obtained from the top 2 or 3 feet in clay soils.

Irrigation during the growing season should be timed carefully to provide adequate water through the critical period of blooming and boll development. Irrigation schedule depends on many factors, such as rainfall, unusual soil conditions, depth of rooting, temperature and humidity.

If water is available for only one irrigation, apply it near the peak bloom stage, about 30 days after first bloom. If two irrigations can be made, apply one about 15 days after first bloom, another about 15 to 20 days later. When three or more irrigations are available, irrigate about the time of the first bloom and every 12 to 18 days afterward. Use the shorter interval if root development is restricted to shallow depths.

VARIETIES AND PLANTING SEED

Consult the County Result Demonstration Handbook and Experiment Station test results. For spindle picking, plant high-yielding, open-boll types, such as Stoneville, Deltapine, Coker and TPSA 109. For stripping, plant storm-resistant, boll types such as Lankart, Lockett 4789A, Tamcot 788 and TPSA 110 or 22.

Consider fiber properties as well as agronomic characteristics. Producer groups may wish to consider a single variety community or area.

Plant high-quality, high-vigor, high-gravity seed that have been properly processed and stored. Avoid use of low-germinating, high free-fatty acid seed that have been cracked or mechanically damaged or stored under high moisture conditions. Save planting seed from afternoon harvested cotton.

FOLLOW PRACTICAL MECHANIZATION

PLANTING. Plant as soon as moisture and soil temperature conditions are favorable. Soil temperature should be 65 degrees F. or above for 3 consecutive days with a favorable 5-day forecast. Bed and plant on 40-inch rows. Where possible, plant on shaped beds with precision depth control planting equipment rather than in-the-furrow planting. Advantages of bed planting are: power requirements are less; soil temperature is 3 to 4 degrees higher; control is more precise over depth of seed placement with less scatter pattern in the drill; and there is a significant increase in speed and capacity; also more uniformity in the rate of sprouting; hastens seed germination and increases rate and uniformity of growth and maturity. Average yield increase is about 28 percent. Bed planting helps postemergence

weed control practices, such as use of lateral oiling shoes and the application of DSMA to grass and weeds in young cotton.

PLANTING DATES. Follow the optimum planting dates given in L-219, *Ways to Fight the Pink Bollworm in Texas*.

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. In some areas use a steel roller on the seed drill approximately 1 to 1½ days following planting. This conserves moisture and helps post-emergence weed control practices.

CULTIVATION. Cultivate only when necessary to control weeds and prepare for irrigation. The rotary hoe allows high speed cultivation and covering of maximum acreages.

CONTROL INSECTS, DISEASES AND WEEDS

INSECT CONTROL. Insects frequently are major limiting factors in profitable cotton production in the Rio Grande Plain. Most insects can be controlled effectively by following recommended control programs. Use insecticides only when field inspections reveal economic levels of damaging insects. Indiscriminate and prolonged use of insecticides is costly and results in 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 decisions upon current field situations.

Thrips, aphids and fleahoppers are 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 buildup.

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-561, *South Texas Guide for Controlling Cotton Insects*. Also see L-219, *Ways to Fight the Pink Bollworm*.

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

Table 1. Protectant fungicides for treating cotton seed

Chemical	Oz. per 100 lb. of seed	
	Machine delinted	Acid delinted
Captan (75%)	2	2
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, Terracolor 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 fertilizer.

Root-knot nematodes and fusarium wilt: Plant tolerant varieties. For reniform nematodes, rotate at least 2 years with grain sorghums. Do not use corn in the rotation. Fumigants applied 18 inches deep before planting, Telone or D-D at 8 and 10 gallons per acre respectively in the beds, give good control. Use these practices only when there is a demonstrated need.

Cotton root rot: Follow a 3-year rotation program with cotton, sorghum and small grains. Turn the residue or small grains under deeply with a moldboard plow.

Boll rots: Avoid excessive stalk growth. Bottom defoliation is helpful. Botran, a fungicide, is labeled for use and is effective.

WEED CONTROL. Chemical control should supplement rather than replace careful cultivation. Free beds of weeds before planting. Disturb the seedbed as little as possible to conserve moisture. Cultivate or return middles to clean beds before planting. Use the rolling cultivator and row disks on beds before planting if a winter weed problem exists. Consider using pre-plant and pre-emergence herbicides on a band basis for economy reasons.

Proper fungicidal treatment of planting seed can aid in reducing stand losses, and the use of good seed will produce healthier seedlings which will aid post-emergence weed control.

Nine chemicals are recommended for use as pre-emerges in cotton: CIPC, Cotoran, Caparol, Dacthal, Herban, Karmex, Telvar, Planivan and Treflan. All can be applied as a band at planting time with equipment mounted on the tractor behind the planter or they can be banded or broadcast as a separate operation immediately after planting. Planivan and Treflan must be incorporated in the soil. They can be broadcast in the fall or spring before planting. They also can be

sprayed on the beds and incorporated with a Roll-N-Cultivator, row disk, Do-All or power-driven roto-tiller.

Planivan or Treflan also can be band incorporated shallow with a roto-tiller at the time of bed shaping before planting. The operator must know where the zone of incorporated herbicide is and place the seed at the bottom edge of the zone. See B-1029, *Suggestions for Weed Control with Chemicals*.

Read and study the herbicide labels.

Chemical weed control practices:

- Pre-plant spray for Johnsongrass (Dalapon).
- Pre-plant soil incorporated—fall or early spring
 1. Broadcast disking
 2. Banding—power-driven rotary tiller
- Pre-emerge—banding usually or broadcast
 1. Planter mounted
 2. Separate operation
 3. Overlay or double treating
- Post-emergence (more positive; Don't wait too long to begin)
 1. Later oiling—herbicidal oils
 2. Emulsifiable oils—before and after barking
 3. Directed spray—
 - a. DSMA or MSMA + Surfactant—(3 inches tall to first bloom)
 - b. DSMA or MSMA combinations with Herban, Karmex, Cotoran or Caparol + surfactant
 4. Over-the-top-Cotoran
 5. Eptam-soil injection of sub-surface
 6. Spot-spraying
 7. Layby

In years of good moisture and areas of high rainfall (above 30 inches annually), chemicals to control weeds and grass offer a means to avoid hand hoeing. A number of herbicides are available. All have some limitation. Study the materials and learn as much as possible about their use. Each grower can work out a system suited to his land and equipment.

Mechanical weed control practices:

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| <p>Before planting</p> <ol style="list-style-type: none"> 1. Summer fallow 2. Disking 3. Harrowing 4. Chisel plowing 5. Bedding or listing 6. Rebedding or relisting 7. Row discing 8. Roll-n-cultivator (rotary hoeing) 9. Knifing or go-devil 10. Bed cultivation 11. Bed shaping | <p>At or after planting</p> <ol style="list-style-type: none"> 1. Capping or hilling up 2. Rotary hoe-broadcast 3. Rotary hoe-row mounted 4. Sweep cultivation 5. Rod weeder 6. Harrowing 7. Sand fighter 8. Power driven rotary tiller 9. Cross plowing 10. Mechanical thinner 11. Baring off 12. Flaming |
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Mechanical weed control and careful attention to cultivation is cheaper and safer than all-out use of chemicals. In low rainfall years, the mechanical practices may be sufficient. Perhaps post-emergence chemical practices plus mechanical methods may be sufficient.

HARVEST, HANDLE AND GIN FOR HIGH GRADE

About 98 percent of the Texas crop is machine harvested. Growers generally are doing an efficient job of machine harvesting. Close cooperation of 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*. Cotton should be harvested 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 cotton stands in the trailer on the gin yard during crowded seasons and has been harvested damp, it will begin to "sweat" and injure grades and germination of the seed. Cotton should be defoliated with a true defoliant for machine picking. Use the phosphorous-type defoliants, DEF or Folex, if second growth conditions prevail. The chlorate defoliants work well in mature leaf cotton. Desiccants should be used for cotton to be machine stripped. The skill of the operator is important, and he should follow the operators' manual. Operators should make use of the "Cotton Harvest Loss Estimator" to determine machine harvesting efficiency. If a conventional stripper is used, the trailer should be equipped with a "waggon 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. Avoid the use of excessive water on the spindles. Usually 2 gallons of plain water per bale is the recommended amount. Use of textile oils as spindle moistening agents is not recommended.

Bark is quite a problem in the 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 if it shows up in

a sample, the grade will drop. Wait until the stalk is dry, perhaps about a week or longer before stripping following desiccant application.

MARKET HIGH QUALITY COTTON

Know the value of your 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 per acre. 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 can be obtained from county ASCS offices.

ECONOMICS OF PRODUCTION

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

Table 2. Estimated costs and returns for producing cotton in the Rio Grande Plain per acre

	Coastal bend 500 lb. lint	Lower valley irrigated 750 lb.	Lower valley dryland 350 lb.	Winter garden irrigated 1,000 lb.
Production returns				
Lint at 20.25	101.25	151.88	75.94	202.50
Seed at \$40 a ton	16.00	24.00	12.00	32.00
Returns from production only	117.25	175.88	87.94	234.50
Approximate government payment (Domestic allotment only)	73.65	110.47	51.55	147.30
Total returns (Domestic allotment only)	190.90	285.35	139.49	381.80
Production costs				
Tractor & equipment	8.34	19.23	12.35	13.15
Seed at 12¢ lb.	2.40	2.80	2.40	2.80
Fertilizer	7.60	13.60	4.80	10.72
Insecticide (material & application)	7.60	19.50	4.50	35.00
Herbicide	8.00	7.40	7.40	8.40
Defoliant	3.00	2.50	2.50	3.00
Labor (\$1.30 hr.)	3.00	5.90	3.00	4.30
Irrigation water		7.50		20.00
Irrigation labor		3.90		6.50
Total	39.94	82.33	36.95	103.87
Harvest costs				
Custom harvest at \$25 a bale	25.00	37.50	18.75	50.00
Hauling, at 25¢ cwt.	3.60	5.52	2.60	7.15
Ginning, bagging & ties	20.30	31.13	14.84	40.24
Total	48.90	74.15	36.19	97.39
Interest on operating capital 8% for 6 mo.	1.31	2.76	1.15	3.37
Total specified costs	90.15	159.24	74.29	204.63
Net returns on domestic allotment (65% of farm allotment)	100.75	126.11	65.20	177.17
Net returns on remaining allotment (35% of farm allotment)	27.10	16.64	13.65	29.87