FACT SHEET

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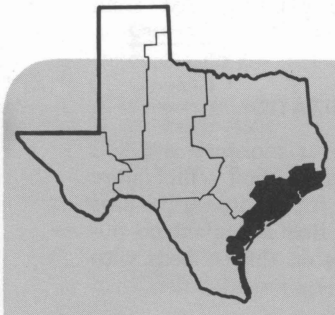

KEYS TO PROFITABLE COTTON PRODUCTION IN THE GULF COAST PRAIRIE

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 up 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 on shaped beds 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 pre-plant irrigation and for the soil to become firm before planting. Some areas may require rebedding. This usually is not recommended after November. Before the last rebedding, apply commercial fertilizer based on a reliable soil test and past experience with fertilizer results.

FERTILIZATION. Soils of this area are particularly low in nitrogen and phosphorus. Sandy soils also may be deficient in potassium. For soils quite deficient in nitrogen, phosphorus and potassium, a 60-60-60 is suggested for expected production levels of about 1 bale per acre and 100-100-100 for yield goals of 1½ to 2 bales per acre if banded below the row at or before seeding. Broadcast application rates should be increased by ¼ to ⅓ of these rates.

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 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 chemical 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. Maximum cotton yields may require 18 to 20 inches of water. However, good yields are possible with less water if irrigation is timed carefully to adequately supply the crop during critical water demand periods. Efficient and profitable irrigation depends upon when water is available, as well as the amount.

Daily water use generally is less than 0.1 inch per day until squares form. Water use increases rapidly when blooming starts. It remains at 0.25 to 0.40 inch per day through the blooming-boll development period, and decreases as the first open bolls appear.

Adequate moisture at planting time helps assure uniform stands, provides water for early season growth and encourages deep root development. A pre-plant irrigation can supply this water when rainfall has not replenished moisture in the root zone. Apply enough pre-plant irrigation water to fill the potential zone to field capacity.

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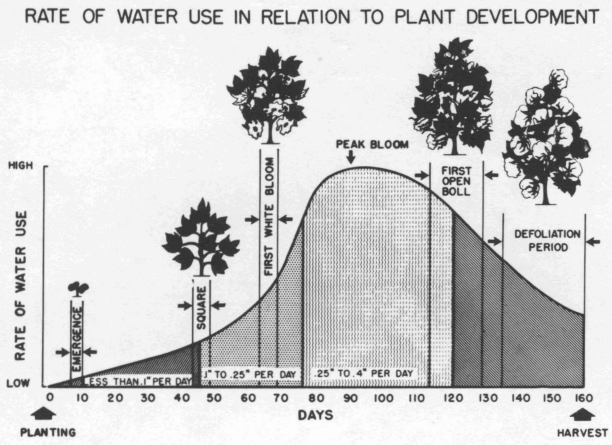

Fig. 1. Daily water use by cotton throughout the growing season.

Cotton roots may grow to 5 or 6 feet in deep loam or sandy loam soil. But heavy clay subsoils, compacted zones, clay layers and other soil conditions often restrict root development to shallow depths. Even in deep, medium soils, most of the water for the crop is in the top 3 to 4 feet. In heavy clays, most of the crop's water is in the top 2 to 3 feet of soil.

Variable rainfall prevents the establishment of specific irrigation schedules during the growing season, but irrigation generally is not essential before the bloom stage if the root zone contains maximum moisture when the crop is planted. Adequate moisture is especially important from early bloom stage through the boll development period. For high yields, the cotton crop will require 3 to 4 inches of water every 12 to 15 days during this period. If rainfall does not supply this water, irrigation should be used to apply an equivalent amount. Some very coarse sands or shallow soils may require smaller amounts of water more frequently.

Moist soil conditions may slow maturity. To encourage earlier maturity, the interval between irrigations may be increased after peak bloom stage, about 30 to 35 days after the first bloom. Irrigation past mid-August increases the risk of poor harvest conditions because of late crop maturity.

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, Locket 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, 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 upon the beds than down in the furrows; 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 emergence, quicker seed germination and stand, increased rate and uniformity of growth and maturity and average yield increase of 28 percent. Bed planting 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 DATES. Follow the optimum planting dates given in L-219, *Ways to Fight the Pink Bollworm in Texas.*

PLANTING RATE. Plant 6 to 8 seed per foot of row to provide a final stand of 3 to 4 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 in the seed drill approximately 1 to 1½ days following planting. This conserves moisture and helps post-emergence weed control practices.

CONTROL INSECTS, DISEASES AND WEEDS

INSECT CONTROL. Insects frequently are the major limiting factor in profitable cotton production. 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 early season pests. Control of these pests helps insure early fruiting and maturity. Insecticide control decisions are

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

influenced by population level and the 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 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-218, *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:

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 fertilizer.

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. Plant early as practical.

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

WEED CONTROL. Chemical control methods should supplement rather than replace good careful cultivation. Free beds of weeds before planting. Disturb the seedbed as little as possible to conserve moisture. Cultivate or rerun 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 just behind the planter, or they can be band or broadcast as a separate operation immediately after planting. Planivan and Treflan must be incorported in the soil. They can be broadcast in the fall or spring before planting. They also can be sprayed on the beds and incorported 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 injected 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 limitations. 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:

Before planting	At or after planting
1. Summer fallow	1. Capping or hilling up
2. Disking	2. Rotary hoe-broadcast
3. Harrowing	3. Rotary hoe-row mounted
4. Chisel plowing	4. Sweep cultivation
5. Bedding or listing	5. Rod weeder
6. Rebedding or relisting	6. Harrowing
7. Row disking	7. Sand fighter
8. Roll-n-cultivator (rotary hoeing)	8. Power-driven rotary tiller
9. Knifing or go-devil	9. Cross plowing
10. Bed cultivation	10. Mechanical thinner
11. Bed shaping	11. Baring off
	12. Flaming

Mechanical weed control and careful attention to cultivation is cheaper and safer than all-out use of chemicals. In low rainfall years, mechanical practices may be sufficient.

HARVEST, HANDLE AND GIN FOR HIGH GRADE

About 98 percent of the Texas crop is machine harvested. Growers generally are well informed and 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 phosphorus-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. Skill of the operator is important, and he should follow the operator's manual. If a conventional stripper is used, the trailer should be equipped 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 6½ 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 per acre for production of upland Cotton in the Texas Gulf Coast

Production returns	Amount
Lint: 650 lb. @ 20.25¢ per lb.	$131.63
Seed: 1040 lb. @ $40 per ton	20.80
Returns from production	152.43
Approx. government payment (domestic allotment only)	95.74
Total returns on domestic allotment only	$248.17
Production costs	
Seed @ 10¢ per lb.	$ 2.50
Tractor & equipment: 4.35 hr. @ $1.50	6.53
Fertilizer 50-50-0	12.00
Labor: 7 hr. @ $1.30 per hour	9.10
Herbicide	9.10
Insecticide (8 applications)	14.25
Hoeing: 3 hr. @ $1.30 per hr.	3.90
Interest on operating capital	2.30
Total production costs	$ 59.68
Harvest cost	
Defoliate (custom)	$ 4.00
Picking (custom)	36.40
Hauling	4.65
Ginning, Bagging & ties	23.28
Total harvest costs	68.33
Total production & harvest cost	$128.01
Net return on domestic allotment (65% of farm allotment)	120.16
Net return on remaining allotment (35% of farm allotment)	24.42

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