

Shortening the cotton season: Can the savings in bug and water costs outweigh lower yield?

By R. G. Fowler

Short season cotton, more talk than reality at this point, will get a full-scale testing during the 1980 growing season by the University of Arizona Agricultural Experiment Station and with at least two cooperating commercial growers.

The latter are Paul Prechel, a UA plant science graduate who farms near Coolidge, and Paloma Ranch at Theba.

Dr. R. P. Upchurch, head of the department of plant sciences, serves as chairman of the College of Agriculture short season cotton committee. The project leader is Dale Cannon, agricultural engineer stationed at the UA Cotton Center in Phoenix.

Basically, the idea of short season cotton calls for shortening the growing season on either one end or the other. Most emphasis this year will be on use of a normal planting date with an early cut-off in the fall. Here are the important reasons for doing so:

One, in terms of insecticide use, fall is the most expensive part of the growing season, a time when cotton

producers combat two late season pests, the pink bollworm and the tobacco budworm.

Two, UA entomologists point out that if you make a final defoliation near mid-September, you catch the pink bollworm as it starts to enter diapause, its less vulnerable over-wintering stage. Allow the population another three or four weeks as with conventional cotton, and you insure a following season infestation because much of the existing pinkie population will sleep away the winter in trash and near the soil surface.

Snatch away the dinner plates—young bolls—before pinkie is ready to go into over-winter quarters, and you've got him!

Three, by terminating cotton early, the chief savings may include one or two late season irrigations which in some areas of the state would cost \$40 to \$50 per acre.

Four, and those three or four weeks saved may also include one to five insecticide applications. Figure the savings at \$8 to \$10 per acre for each.

While it may appear that insect problems are the chief talking points for the short season cotton idea, that is not altogether the case. For example, early season cotton fiber is of better quality than that which is picked late in the season. "Growers don't get paid for early season quality, but they get docked for lower quality fiber later," points out Dr. B. Brooks Taylor, UA cotton specialist.

Finally, with new emphasis on increasing returns per acre, shortening the cotton-growing season will permit a farmer to come back with a second crop such as wheat or barley in much more timely fashion following cotton. Remember, too, that every fall is not open and warm as it was in 1979, permitting a high percentage of late cotton flowers to go on and "make."

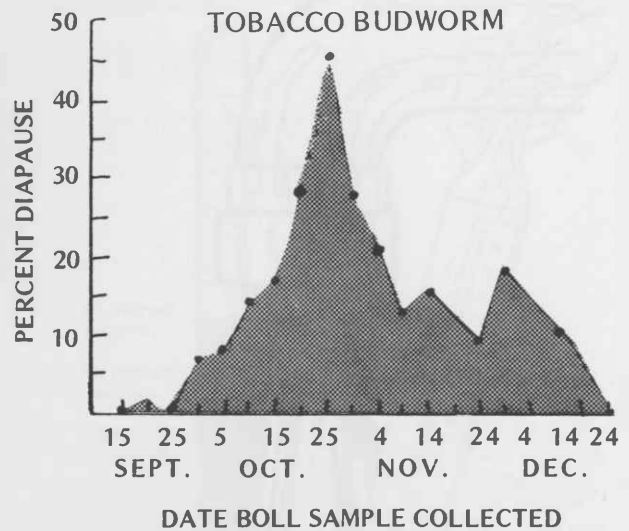
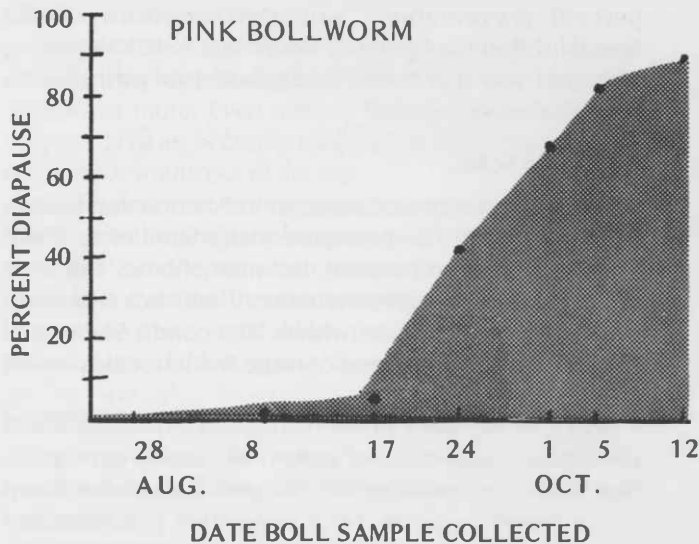
Despite the best intentions of anyone involved in the short season cotton project, its eventual success or failure will boil down to how it fits the bottom line for individual growers. Taylor says it best: "If we can show growers that short season cotton pays, there's no question that the idea will be accepted.

"If we can't prove it pays, you cannot expect growers to accept a system that is not competitive with the way they grow cotton now."

You can bet that the short season cotton project will get plenty of critical attention. With their areas of expertise listed, the committee includes the following UA scientists: Dr. Delmar D. Fangmeier, irrigation engineer; Dr. Warner D. Fisher, short staple cotton breeder; Dr. Richard B. Hine and Dr. Thomas E. Russell, plant pathologists; Dr. Roger A. Selley, agricultural economist;



Pink bollworms survive the winter in a diapause state. These pinkie larvae are diapausing inside a young boll. When fewer bolls are available in early autumn, fewer larvae can enter the diapause state.



The dates when most bollworms and budworms are going into the diapause state, shown above for sample years, is important for short-season planning. Getting the bolls out of the field before those dates minimizes the number of larvae able to bed down for the winter.

Dr. Thomas C. Tucker, soils scientist; Dr. Dale G. Fullerton, entomology; and Dr. Scott Hathorn, Jr., farm management.

Dr. Carl Feaster, USDA long staple cotton breeder stationed at the UA Cotton Center in Phoenix also serves on the committee.

Variables under scrutiny in the overall master plan include early termination of irrigation, varieties, insect control, and harvest methods.

As you might expect, cotton breeders have not been unaware of the interest in short season cotton. They have come up with varieties that play into the hand of a shorter growing season. Two examples are DPL-70 and Stoneville 825. Meanwhile, these earlier maturing varieties will soon be surpassed by others which offer even greater short season growing advantages.

On the important insect question, entomologist Watson sizes up short season cotton and the pink bollworm-tobacco budworm complex this way: "Certain aspects

of the biologies of both of these important pests indicate that short season cotton would virtually eliminate these insects as pests of cotton. Or, it would at least relegate them to minor pest status.

"Both require overwintering populations, and winter carry-over is essential to provide the initial infestation the following year."

As a method for shortening the growing season for cotton, irrigation termination has probably been researched more than anything. Terminating water early would have a two-fold benefit: One, it would help reduce late season insect pressure; and, two, it would obviously cut irrigation costs, a not-to-be-overlooked item in a period of rising pump energy costs.

In talking about short season cotton, it is only fair to mention the risk: reduced yield.

Since 1965 in Maricopa County, County Agent Charles Farr and Dr. David Kittock, USDA agronomist, have teamed up to study various irrigation termination dates. Their figures show that a mid-August final irrigation increased lint yield by an average 112 pounds per acre vs. an early August final irrigation. Further, an early September irrigation termination resulted in an average 50 pounds more lint per acre when compared to a mid-August cut-off.

Final irrigations at late September resulted in a slight yield reduction when compared to the early September final irrigation. Of course, the warm, dry September in 1979 was an exception to this, but can you count on it year after year?

As the UA scientists look at their plans for 1980, they have more questions than answers. The answers will come with experience—that's what research is all about.



Narrow row spacing is one strategy being tested for short-season cotton. By early July, seven-inch rows (left) are already taking full advantage of sunlight. Normal 40-inch spacing (right) still leaves bare ground.