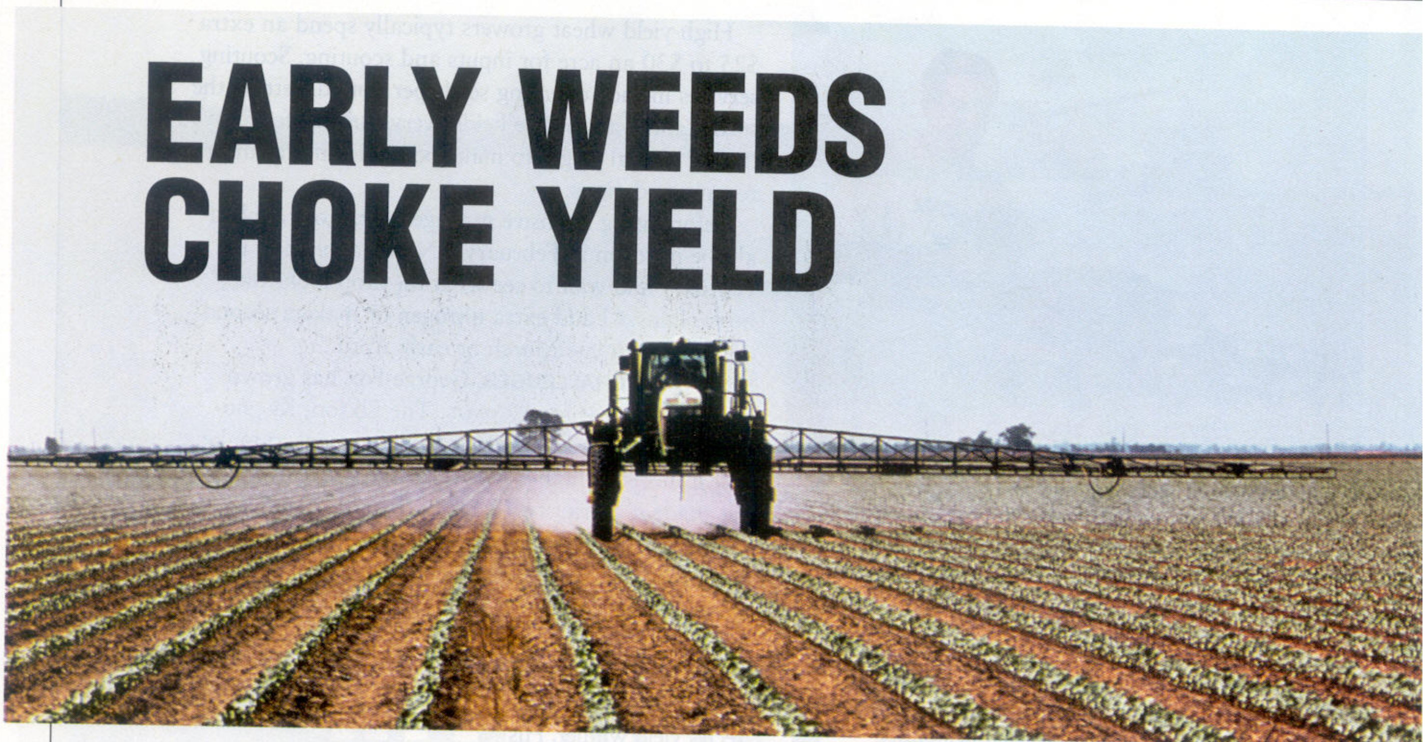
EARLY WEEDS CHOKE YIELD



If you don't start with a clean field, expect yield losses of 30% or more.

STORY AND PHOTOS BY BILL BARKSDALE

Struggling against a tough soil crust, the cotton seedling finally reaches that anticipated moment. Emergence! But it's not a pretty scene. Weed seedlings already occupy the site. There's little chance the young cotton plant will reach its potential unless relief comes soon. Cotton just can't stand early weed competition.

"The worst thing you can do is to let cotton grow up in weeds from the get-go," warns Roger McDaniel of Clarkton, Mo. "An early weed infestation is going to hurt your yield. Plus, you may injure the cotton with cleanup applications, or you may never get all the weeds under control. Even if the field is clean and pretty once it's defoliated, you're probably going to pick less cotton."

Weed scientists have documented the effects of early-season competition in cotton for decades. Their research consistently shows yield deteriorates when weeds compete during the first few weeks after crop emergence.

Researchers generally agree cotton should be weed-free by about three weeks after planting to protect yield potential. During a cloudy, cool spring when cotton grows slowly, the period of high susceptibility to weed pressure can be even longer.

In early research with Roundup Ready cotton, North Carolina State University Extension weed scientist Alan York gathered convincing data that's still relevant today. He compared the effect of removing weeds from 2- to 3-leaf cotton (three to three-and-a-half weeks after planting) versus weed removal in 7- to 8-leaf cotton (six to seven weeks after planting).

With early weed removal, yield was 1,619 pounds of lint per acre. Yield fell to 709 pounds for a 56% decrease with later weed removal.

But top yields of 1,713 pounds per acre were achieved where York used Treflan preplant incorporated, followed by Cotoran applied at planting, followed by Roundup at the 7- to 8-leaf stage.

Nothing has changed. "The crop is no more or less susceptible to competition than it ever was," says Andy Kendig, University of Missouri Extension weed scientist. "What has changed is the way cotton is grown."

TOUGH QUESTIONS. Today with Roundup Ready, Roundup Ready Flex and Liberty Link technology, it's tempting to let weeds go for a few days, expecting to remove them with an easy, over-the-top spray.

This approach raises three major questions: Will conditions allow spraying when you decide to apply herbicide? Will that application control all the weeds? How much yield potential will you have already lost?

In 2006 research at the Delta Center, Portageville, Mo., Roundup WeatherMax was applied at various times to Roundup Ready Flex cotton. The dominant weeds included glyphosate-susceptible Palmer amaranth, morningglories and crabgrass.

There was a 230-pound-per-acre yield advantage for spraying cotton at the 1- to 2-leaf stage versus waiting until cotton was at the 3- to 4-leaf stage. Yield was 35% better with early weed removal.

So what made the difference? A cotton field is like a factory, Kendig explains. The job of the factory is to catch sunlight and turn it into energy. If weeds intercept sunlight, the factory runs on less energy, and output declines.

Weeds also compete for moisture and nutrients. During a dry spring, competition for moisture can delay crop emergence and reduce stand establishment.

Early weeds also harbor insects such as spider mites, and cutworm moths seek weedy places to lay eggs.

Horseweed wreaks havoc in cotton.

Additionally, cotton often suffers more cutworm damage where burndown herbicide is applied shortly before planting compared with using a burndown 21 to 30 days before planting, says Larry Steckel, University of Tennessee Extension weed scientist.

PREEMERGENCE POWER. So, should a preemergence herbicide be used to prevent early competition? If all the weeds are susceptible to glyphosate, timely applications of Roundup can do the job. But careful scouting and timeliness are essential. Delays caused by weather or lack of attention can lead to weed competition and, consequently, yield losses.

Using a preemeregence product gives some protection if the postemergence herbicide can't be applied in a timely manner. And a preemergence herbicide is even more important in fields with glyphosate-resistant weeds such as horseweed or Palmer amaranth, or hard-to-control species like Florida pusley.

Missouri grower McDaniel routinely uses a residual treatment on his 2,500 acres of no-till Roundup Ready and Roundup Ready Flex cotton. He surface-applies a 16-inch band of Prowl on the entire acreage and tank-mixes it with Cotoran on fields where pigweed or cocklebur are major problems.

"This keeps our cotton clean for the first two to four weeks," he says. "And it reduces the chance of having early weeds, then getting into a weather situation where we can't apply Roundup on time. There's another advantage too. If it's a dry spring, we spend our time irrigating—not spraying—to clean up weeds."

Grass or broadleaf?

Do grasses or broadleaf weeds pose the greatest early-season threat to cotton? Evidence suggests grasses such as broadleaf signalgrass, crabgrass and fall panicum are the worst culprits. But early-emerging broadleaves, such as pigweed, lambsquarters and, of course, glyphosate-resistant horseweed, can be problematic.

"I think broadleaves and grasses can be equally competitive early on," says Louisiana State University weed scientist Donnie Miller. "But under moisture-limiting situations, grasses are especially difficult due to the high numbers present in most cases and growth habits."

Any weed is a threat in high numbers. North Carolina State University weed scientist Alan York puts it this way: "The amount of competition is density-dependent. More weeds equal more competition."

Resistant weeds create early competition threat

Preventing early-season competition becomes more challenging with glyphosate-resistant weeds. Two resistant species—horseweed (marestail) and Palmer amaranth—now exist in parts of cotton country. And they're spreading.

Two years of research show that glyphosate-resistant horseweed competing up to the second true leaf reduces cotton yield by 40%, says University of Tennessee Extension weed scientist Larry Steckel. He now ranks glyphosate-resistant horseweed as the state's worst cotton weed problem.

"Just four to five years ago, growers controlled this weed with one over-the-top application of glyphosate," Steckel says. "That's no longer an option. And we have no other postemergence cotton herbicide that controls resistant horseweed."

Result: Growers now spend more on herbicides. Typically, an early-spring burndown with 2,4-D, Clarity or Valor is made. That is followed by a burndown several weeks before planting and includes glyphosate plus a residual such as Caparol or Cotoran.

"This provides good control of glyphosate-resistant horseweed through crop emergence," Steckel says. Adoption of such programs has been widespread. Five years ago, virtually no preemergence herbicide was used on Tennessee cotton. In 2006, 90% of cotton acres were treated with a soil residual herbicide.