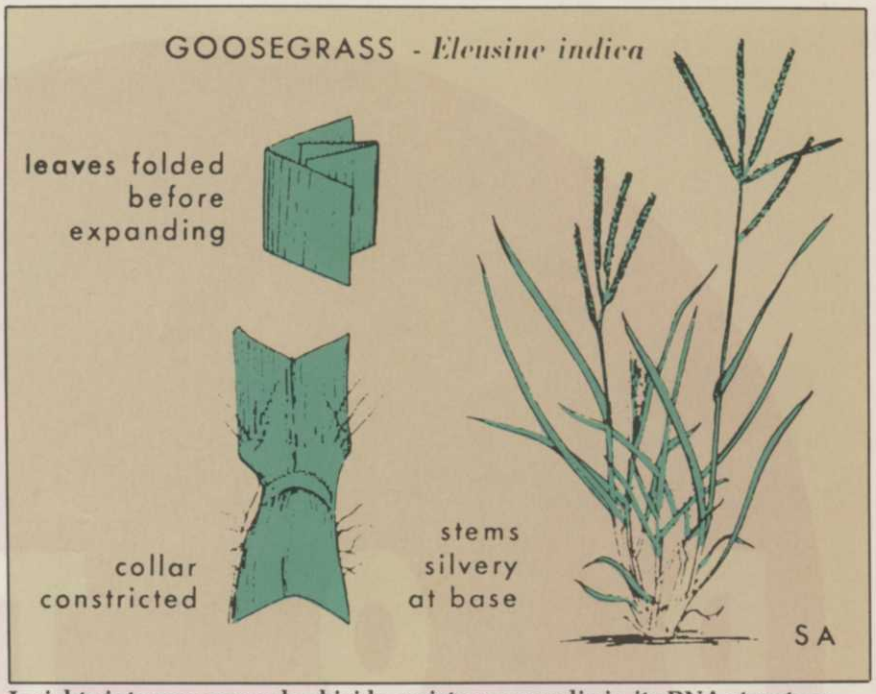
Tenacious goosegrass subject of study

Researchers at Clemson University are studying the genetic structure of goosegrass to solve the mystery of the species' remarkable resistance to common herbicides.

"We're taking a genetics approach to characterize resistance in the population rather than in the individual plant," says horticulturist Vance Baird. "We're trying to define susceptible plants and resistant plants through DNA techniques."

According to Baird, DNA identification is more specific than any visual determination made by the naked eye.

Goosegrass presents major problems to farmers and turf professionals throughout the Southeast. According to Ted Whitwell, a Clemson weed scientist, cotton farmers in South Carolina already spend about $25 per acre for herbicides. Goosegrass' resistance costs them an extra $10 to $15 per acre.



Insights into goosegrass herbicide resistance may lie in its DNA structure.

Ancestral clues

Clemson researchers are investigating if the resistant plants are the same or if they exhibit differences. According to Baird, if all the plants have the same resistance, it's safe to assume that they probably evolved from a common ancestor. Plants with different resistance capabilities, says Baird, indicate that the resistance phenomenon has arisen more than once. Genetic analysis distinguishes between the two possibilities, and allows scientists to eliminate one and focus on the other. Since farmers use like cultural and herbicide control practices, Clemson researchers believe the findings can apply anywhere.

Herbicides of choice

The herbicides commonly used to control goosegrass—which Clemson lists as Treflan, Prowl and Balan—belong to the dinitroanaline family of herbicides. They are widely used on row crops, turf and ornamentals. The products attack a specific protein in the grass, and it is that protein which gives researchers a starting point.

One possibility is that the resistance has existed since the plant's origin, but no one has been spraying herbicides to allow those few individual plants to survive and become a significant part of the natural population of goosegrass.

"The herbicide eventually killed off all the susceptible ones until only the resistant ones were left; but they were there all along," says Baird.

Another possibility is that there were no resistant plants, but that a recent genetic mutation has converted a susceptible plant into a resistant one. With continued use of the herbicide, their numbers are showing up large enough to detect them.

The one-year research program is funded by the USDA's Southern Regional Impact Pesticide Assessment Program. **LM**

Vance Baird