

What will be our future weed management options? Dotray, P.A. and J.W. Wilcut. Texas Tech University, Texas Agricultural Experiment Station, and Texas Cooperative Extension, Lubbock, TX 79409-2122 and Crop Science Department, North Carolina State University, Raleigh, NC 27695. The ability to use glyphosate in glyphosate-resistant crops will be noted in history as a dominant herbicide revolution similar to the discovery of 2,4-D, atrazine, and the sulfonylureas and imidazolinones. The use of glyphosate in-season increases the opportunity to minimize competition of hard-to-control annual and perennial weeds in agricultural crops. The use of glyphosate resistant crops has improved weed management in the short term. For some crops, glyphosate in-season has reduced the use of preplant and/or preemergence herbicides, but in other crops glyphosate has reduced postemergence-directed applications, cultivation, spot spraying, and hand hoeing. The rate of weed species shifts and the selection for glyphosate-resistant weeds will likely increase because of the increased use of glyphosate. In agricultural areas where nonglyphosate-resistant crops are an integral rotational crop, the rate of weed population shifts and development of glyphosate resistance will occur at a slower rate. The number of herbicide options in the future excluding generics will likely decrease, but some of the traditional (standard) options will continue to play an important role in weed management. If glyphosate usage continues to increase, the industry incentive to support existing and older active ingredients may decrease. If glyphosate resistant weed develop or major shifts in weed populations occur, fewer herbicide options may be available due to the number of older herbicides lost to re-registration and the decline in the number of herbicides brought to market. From the producer's standpoint, economics still drive the weed management decisions since many are operating on a slim to no-profit margin. The short-term feasibility of using glyphosate-resistant crops today may not be feasible or as sustainable in the future. So what is the future? Weed control systems that integrate tillage or nonglyphosate applications, crop rotations and rotations of herbicide modes of action, cultural and biological weed control inputs, and herbicides will still be important. In addition, improvements in application technology, a better understanding of herbicide mode of action and basic weed biology and ecology at the user level, new modes of action, other transgenic crops based on different modes of action, an emphasis on the development of more aggressively competitive crop varieties, mixtures of herbicides based on different modes of action, and precision applications will aid in long-term sustainable weed management. Government programs may help by putting a premium on innovative and sustainable weed management systems.