

Host Plant Resistance

The interactions of crop-eating pests with their crop hosts are complex and have many facets. Plants possess many traits that influence these interactions and thereby enable them to defend themselves against the attacks of pests. Plant resistance may be defined as the sum of heritable (inherited by offspring from a parent) plant traits that reduce the negative impacts of plant-eating pests. The defensive traits of crop plants include traits that reduce colonization (initial infestation) of the crop by the pest (antixenotic traits), traits that reduce the ability of the pest to grow and reproduce on the crop (antibiotic traits), and traits that allow the plant to recover and compensate for injury (tolerance traits). Different genotypes (genetic makeups) of crop plants can differ in their inherent resistance to plant-eating pests because they differ in the degree to which they possess these antixenotic, antibiotic, or tolerance traits. Because these traits are heritable, high-yielding crop varieties with greater inherent resistance to pests can be developed through selective breeding. Usually, the resistance expressed by these varieties is not complete — in other words, resistant varieties are usually not immune to (unaffected by) crop pests but rather suffer lower injury than more susceptible varieties under the same numbers of pests. These resistant varieties can serve as very useful components of integrated management programs, not only because they are inherently less susceptible to pests but also because the use of resistant varieties is usually compatible with other management tactics, such as biological control or insecticides. Varieties of many of Louisiana's most important crop plants with resistance against important insect pests are developed and available for use as components of management programs. For example, sugarcane varieties with partial resistance against stem-boring pests and wheat varieties with high levels of resistance against Hessian fly have been developed. The use of these resistant varieties is highly advisable when available because their use is cost-effective and reduces the amount of insecticide needed to manage pests. The availability and effectiveness of pest-resistant crop varieties are described in various crop-specific production guides issued by the LSU AgCenter.