

Weed Physiology Research Program

A. Mission

To conduct collaborative applied and basic research programs to address the weed management needs of New Mexico stakeholders by developing immediate and system-based solutions in various crops and situations.

B. Justification and Objectives

Integrated weed management is a cropping systems approach to weed control that requires basic knowledge of biological, ecological and physiological systems of concern. Simply defined, integrated weed management requires integration of weed control components rather than reliance upon a single technology. However, for integrated weed management to gain acceptance by the stakeholders it must meet the following criteria. First, the components of an integrated weed management system must be designed to work in a complementary manner on a site- and time-specific basis, and second, it must be integrated easily into existing production practices. Therefore, it is important that our research provide the knowledge base from which stakeholders can make informed decisions.

The Weed Physiology Program is at the forefront of tackling weed control problems in New Mexico crops. The research approach used is tailored towards a better physiological and eco-physiological understanding of weeds and their control, and the utilization of this knowledge to reduce damages caused by weeds. Therefore, the major objectives of Weed Physiology Research Program include:

1. To develop/evaluate integrated weed management strategies for prevention and control of herbicide resistant weed species in cropping systems.
2. To develop site specific weed management programs for different cropping systems.
3. To understand the biology and eco-physiology of toxic and noxious weeds.
4. To develop integrated weed management strategies for control of toxic and noxious weeds.
5. To develop integrated weed management systems for organic production systems.

C. Examples of Past Projects

1. Characterization of resistance to glyphosate in *Amaranthus Palmeri* populations from New Mexico.
2. Response of African rue and associated vegetation to herbicides under drought conditions
3. Role of environmental factors in alkaloid biosynthesis by locoweed.
4. Physiological and biochemical responses of crop plants to environmental stress.

D. Current Projects

1. Understanding the basis of resistance in glyphosate resistance *Amaranthus Palmeri* populations from New Mexico.
2. Examining the relative fitness of glyphosate resistant weed populations as compared to susceptible populations.
3. Development of site specific weed management strategies in pecans and alfalfa.
4. Understanding the plant-endophyte interactions in locoweed populations.

E. Outcomes/Impacts

The Weed Physiology Research Program has been providing New Mexico stakeholders with effective and knowledge-based weed management options to preserve the integrity of the cropping systems and agro-environments in the state. This knowledge-based approach to weed management has been successful in lessening the damage by weeds in agricultural practices and therefore, securing greater crop yield and revenues.