

VIRGINIA SOYBEAN BOARD

PROJECT PROPOSAL – 2012

PROJECT NAME: Weed Management Studies in Roundup Ready® and Non-Roundup Ready® Soybeans

PROJECT LEADERS: Henry P. Wilson
Professor, Weed Science
Virginia Tech
Eastern Shore AREC
33446 Research Drive
Painter, VA 23420
Ph: 414-0724 ext 13
Fax: (757) 414-0730
E-mail: hwilson@vt.edu

OTHERS: Thomas E. Hines, Senior Res. Specialist
Summer Technicians (hourly labor)

LOCATION: Eastern Shore AREC – Painter, VA

INTRODUCTION/JUSTIFICATION:

The increasing presence of herbicide resistant weeds is partially related to a decline in the number of companies involved with herbicides (53 in 1974 versus 9 in 2004) and number of experimental herbicides available for research in our program at the Eastern Shore Agricultural Research and Extension Center (43 in 1974 versus 1 in 2004). Globally there are 174 herbicide-resistant weed species and 107 of these are found in the United States, where at least 11 glyphosate-resistant weeds have been documented. A list of these weeds include palmer amaranth, common waterhemp, common lambsquarters, common ragweed, giant ragweed, marehail (horseweed), Italian ryegrass, rigid ryegrass, goosegrass, plantain, hairy fleabane, and johnsongrass.

Glyphosate sales continue to increase in the United States. According to current estimates, annual global glyphosate production can treat over 1 billion acres. As a result, stewardship of glyphosate use is of high value. Glyphosate use in conjunction with glyphosate-resistant crops is a highly effective system for weed control.

In addition to glyphosate-resistant weeds, there are at least 45 different acetolactate synthase-inhibiting (ALS) herbicides used commercially in soybeans, corn, cotton, and wheat. Rotating ALS-herbicides as we rotate crops does not necessarily reduce, and may increase, the selection pressure from ALS herbicides. For these reasons, we anticipate additional weed resistance to both ALS-herbicides and glyphosate in the near future.

Glyphosate and paraquat have enabled growers to produce an increasing percentage of their crop using no-till methods. The need for preplant burndown of overwintering weeds has resulted in the development of numerous herbicide mixtures for this purpose. Effectiveness of these products is certain to vary with product and application timing. These products need to be further evaluated to enable development of consistently effective recommendations. Several new PPO herbicides are available for weed control in soybeans and should be evaluated for effectiveness both pre-plant and in-crop.

PROJECT OBJECTIVES:

The main objective of this research will be to develop weed control programs in soybeans which reduce glyphosate applications and still provide good control. The purpose is to reduce selection pressures from glyphosate thus slowing the development of resistant weed species to this herbicide. Studies will include several preplant burndown herbicide mixtures. They will include:

- (1) Determine the value of 2,4-D and dicamba in soybean production programs.
- (2) Since glufosinate (Liberty) is now labeled for up to 36 oz. for the first application per season in soybeans, determine if it is more effective preplant or as a postemergence herbicide in Liberty Link soybeans.
- (3) Determine the value of glyphosate in auxin-resistant soybeans.
- (4) Continue studies on growth, development, and control of pokeweed.
- (5) Identify and characterize the resistance of populations of Palmer amaranth on the Eastern Shore.

MATERIALS AND METHODS:

Field experiments will be conducted at the ESAREC to evaluate various crop protection chemical combinations with glyphosate with regard to weed control efficacy. Plots will be 10 ft in width and 20 ft in length and include an untreated buffer between adjacent plots. Fertilizer will be applied according to Virginia Polytechnic Institute and State University Extension recommendations. Glyphosate-resistant soybean and auxin-resistant soybean will be planted in late April to mid May. Treatments will be applied using a tractor-mounted plot sprayer at 25 GPA at 30 psi. The experimental design will be a randomized complete block with three replications including a nontreated check. Treatments will be applied postemergence (POST) to soybean at the V2 to V3 stage or approximately 3 to 4 weeks after planting (WAP). Weeds to be evaluated will be determined at the time treatments are applied. Soybean injury and weed control will be visually estimated using a 0 to 100 scale, where 0 = no injury or weed control and 100 = complete crop death or complete weed control. Crop injury and weed control ratings will be conducted throughout the growing season at regular intervals. Soybean harvest where permitted will be with a small plot combine and yields determined for each treatment. Statistical analysis will be conducted on data and results from these trials will be presented at local, regional, and national meetings. Results will also be used to update Virginia Tech weed control recommendations and Extension publications.

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BUDGET

PROJECT NAME: Reducing Glyphosate Applications in Roundup Ready® and Non-Roundup Ready® Soybeans

ESTIMATED COST: \$15,000

<u>BUDGET:</u>	Wages	\$12,000.00
	Fringe Benefits (9.25%)	\$1140.00
	<u>Materials and Supplies</u>	<u>\$1860.00</u>
	Total	\$15,000.00

BUDGET JUSTIFICATION:

WAGE: Field Experiments will supported by 3 experienced part time wage employees. They will dedicate approximately 40% of their time worked over a period of 7 months to support this project by marking plots, planting, spraying, data collection, harvest, and data entry.

SUPPLIES: Funding will be used to purchase seed, chemicals, and field supplies needed to perform weed resistance trials associated with this project.