Project No: 13C 3419 5229

Title: Perennial Weed Control in Blueberries

Year Initiated: 2007-08 **Current Year:** 2008-09 **Terminating Year:** 2008-09

Personnel: Timothy W. Miller, Extension Weed Scientist, WSU NWREC, Mount Vernon

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Relationship to Washington Blueberry Commission Research Priority:

Control of weeds in a conventional blueberry production system

Justification:

One of the greatest difficulties facing blueberry producers is controlling established perennial weeds within the blueberry block. Weeds such as broadleaf dock (*Rumex obtusifolia*), Canada thistle (*Cirsium arvense*), quackgrass (*Elymus repens*), blackberry (*Rubus* spp.), white clover (*Trifolium repens*), and field horsetail (*Equisetum arvense*) are widespread in western Washington, where the bulk of the state's blueberry production is situated. Previous work at WSU Mount Vernon indicates that weeds such as these can steal from 10 to 30% of total blueberry yield, depending on the year. In the absence of weed control, this reflects a potential loss of up to $3 million to the industry. In addition to direct competition with the crop for water, nutrients, space, and light, weeds can also harbor destructive insects and disease pathogens. Yet another difficulty with weeds in blueberries is their physical interference to berry drop using machine harvesters, often resulting in berry loss. Weeds such as Canada thistle even impact hand-picking of fruit, as any fruit picker with unprotected fingers can testify. Even if weeds are unarmed, they can still reduce efficiency of hand harvest simply by making berries harder to find and pick. Finally, researchers acknowledge that weeds in the blueberry row may act as reservoirs for pestiferous insects and slugs, and as a source of inoculum for blueberry pathogens.

Since most registered blueberry herbicides are dormant season, preemergence products, most do not provide effective control of perennial weed species. Unfortunately, most advanced testing herbicides also are primarily effective on germinating weed seeds. Three products with activity on perennial weed species have shown some selectivity in blueberry, however. These products are Callisto (mesotrione, Syngenta), halosulfuron (Sandea, Gowan), and rimsulfuron (Matrix, Dupont). All are primarily postemergence weed control products, but Callisto and Sandea also offer residual control of germinating annual weeds and suppression of new growth of certain perennial species. Residue testing of Callisto is currently being conducted by Syngenta for potential labeling. Halosulfuron

entered into IR-4 residue testing in 2006, and rimsulfuron received an A priority rating for 2008 testing. Perennial weeds with some susceptibility to Callisto include hedge/field bindweed, broadleaf dock, stinging nettle, and yellow nutsedge, while Sandea and Matrix have activity on yellow nutsedge, quackgrass, and Canada thistle. Combination treatments of Callisto + Sandea or Callisto + Matrix applied during blueberry dormancy or early postemergence should offer expanded perennial weed control potential in blueberries and also aid in the control of many annual weed species as well. Testing of these products in blueberry was conducted during 2007, so 2008 would be the second season of tank mixture testing in the field.

Objective: Conduct testing of Callisto, Sandea, and Matrix for perennial weed control and crop safety in blueberry.

Procedures:

Herbicide studies will be conducted on a grower blueberry block near Mount Vernon infested with established perennial weeds. Callisto, Sandea, and Matrix will be applied alone and in various combinations and rates to the bases of dormant blueberry plants in winter 2007-08 and prior to bud break in the spring of 2008. Postemergence treatments will be made when blueberries are in late flowering. Weed control and injury to blueberry foliage will be evaluated at various times during the growing season. Berry yield and 50-berry weights resulting from these treatments will be determined at harvest (three pickings).

Treatments	Rate
	Product/a
Callisto	3 fl.oz
Callisto	6 fl.oz
Sandea	1.5 oz
Sandea	2 oz
Matrix	2 oz
Matrix	4 oz
Callisto + Sandea	3 fl.oz + 1.5 oz
Callisto + Matrix	3 fl.oz + 2 oz
Sandea + Matrix	1.5 oz + 2 oz
Callisto	3 fl.oz
Callisto	6 fl.oz
Sandea	1.5 oz
Sandea	2 oz
Matrix	2 oz

Matrix	4 oz
Callisto + Sandea	3 fl.oz + 1.5 oz
Callisto + Matrix	3 fl.oz + 2 oz
Sandea + Matrix	1.5 oz + 2 oz
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Anticipated Benefits and Information Transfer:

This study will improve perennial weed control practices in blueberries by adding to the knowledge of growers when they make decisions regarding herbicide selection and application. Data from this experiment will be used to support new herbicide registrations in blueberries. The data resulting from these studies will be disseminated through extension bulletins and during grower meetings sponsored by extension faculty and the agricultural industry.

Budget:

Amount allocated to PI by the Washington Blueberry Commission for FY 2007: $ 5,415

	2008	2009	2010
Salaries[1/]	$ 1,500	$ 0	$ 0
Time-Slip	$ 2,500	$ 0	$ 0
Operations (goods & services)	$ 500	$ 0	$ 0
Travel[2/]	$ 250	$ 0	$ 0
Meetings	$ 0	$ 0	$ 0
Other	$ 0	$ 0	$ 0
Equipment[3/]	$ 0	$ 0	$ 0
Benefits[4/]	$ 963	$ 0	$ 0
Overhead	$ 0	$ 0	$ 0
Total	$ 5,713	$ 0	$ 0

[1]Salary for A/P Scientific Assistant Carl Libbey (0.59 FTE funded by WSU, 0.41 funded by my program).

[2]Travel is for plot establishment, maintenance, and harvest.

[3]Benefits for A/P Scientific Scientist calculated at 38% ($570) and for time slip workers calculated at 15.7% ($393).

Other Support of Project:

Herbicides are typically provided by herbicide manufacturers.