Callisto® 480 SC Use in Wild Blueberry

Callisto® 480 SC (mesotrione) is a broadleaf herbicide registered for the control of weeds as specified on the label in both the sprout and crop year of wild blueberry production. This fact sheet will give background information on the mode of action of this product, review considerations for proper application and outline the expected level of weed control, based on research from the Atlantic region. Callisto targets a different spectrum of weeds than hexazinone (Velpar/Pronone) and is best used to supplement current weed control practices.

Mode of Action

The active ingredient in Callisto, mesotrione, is a Group 27 herbicide. Callisto has both pre-emergent (soil) and post-emergent (leaf) activity. This type of herbicide inhibits an enzyme, p-hydroxyphenyl pyruvate dioxygenase (HPPD) which is involved in pigment synthesis. In susceptible plants, herbicide activity results in bleaching symptoms, followed by plant death (Figure 1). Bleaching typically begins in leaf foliage and at growing points, 3-5 days after application, with weed death 2-3 weeks later. The bleaching symptom may be noted on less susceptible plants (like sheep sorrel in blueberry production) but may not result in plant death.

Figure 1. Bleaching symptom on lamb's quarters and rough cinquefoil caused by Callisto.

Application Considerations

Callisto can be broadcast using ground application, once per year, over the top of the blueberries. Within the cropping season, applications must be made to the crop prebloom and treated areas cannot be harvested within 60 days of application. Apply in 100-200 L water per hectare with a spray pressure of 206-300 kPa. Two application timings are registered; however, most grower experience indicates improved weed control from post-emergent use.

Pre-emergent: Up to the 2 leaf weed stage, apply 0.3 L Callisto/ha. No surfactant is required.

Post-emergent: Up to the 8 leaf weed stage, apply 0.3 L Callisto/ha. A non-ionic surfactant, Agral 90, must be added at 0.2% v/v (2 L Agral 90 per 1000 L spray solution).

Apply using a flat fan nozzle with 50 mesh or larger screens. For uniform coverage throughout the crop canopy, set the nozzles at a downward angle of 90°. When using sprayers without shrouds or cones, a buffer zone of 1 metre is required to protect aquatic habitat, while 4 metres is required for the protection of terrestrial habitat. Callisto should not be applied directly to water or to areas where surface water is present. Avoid application when heavy rain is forecast. Callisto must be

sprayed the same day as it is mixed with water. Applications should not be made to soils with less than 1% organic matter or more than 10% organic matter.

Temporary crop injury (bleaching) may occur if applications are made under extreme weather conditions or when the crop is under stress. Blueberry growers have observed more crop injury when applications are made under hot and/or humid conditions or when the crop is stressed from flooding. The injury is most visible where excessive rates have been applied, such as sprayer overlaps. Do not make a foliar post-emergent application of any organophosphate or carbamate insecticide within 7 days before or 7 days after Callisto application or severe crop injury may occur. No tank-mixes with Callisto are currently registered for use in wild blueberry. There is an increased potential for crop injury when extra surfactant is added. The use of high surfactant rates or non-labelled surfactants has caused leaf burning to the crop (Figure 2).

Figure 2. Temporary blueberry injury caused by Callisto application using a high rate of surfactant.

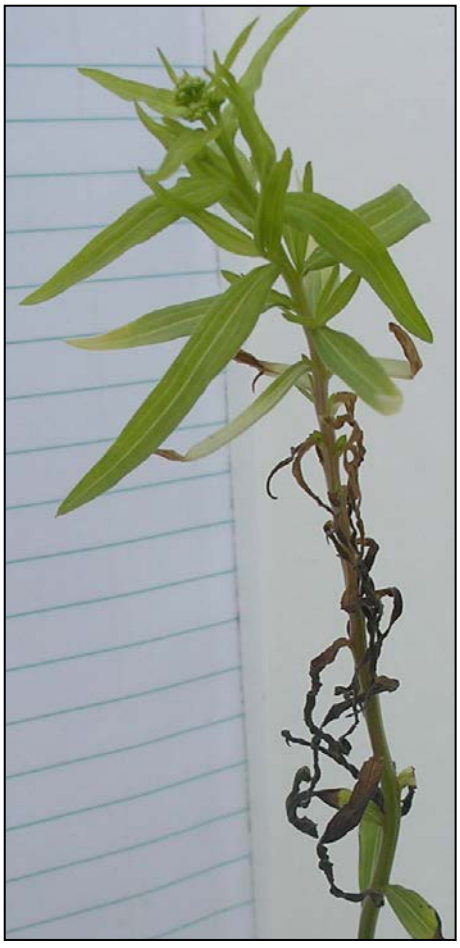

Figure 3. Goldenrod re-growth following Callisto application.

For best results, apply Callisto to actively growing weeds since, in general, less mature weeds are easier to control than mature weeds. Weeds that emerge after an application of Callisto may be controlled after they absorb the herbicide from the soil, provided there is sufficient moisture for uptake. When applied to weeds post emergent, thorough coverage of emerged weeds is essential for effective control. Although weed competition is quickly halted, visual symptoms of dying weeds (discolouration) may take up to 2 weeks to appear, depending on the weed species and growing conditions. Under unfavourable conditions, such as drought, heat, flooding, prolonged cool temperatures or insufficient fertility, adequate control may not be achieved and weed re-growth may occur (Figure 3).

In lowbush blueberry production, mid-June applications have provided the most consistent weed control. Improved weed control has been shown when a hexazinone application is followed with a Callisto application post-emergence, especially on perennial broadleaf weed species.

Effect on Common Blueberry Weed Species

The information below was compiled from the Callisto label, based on experience from growers and research trials performed at the University of Maine, Dalhousie Agricultural Campus and New Brunswick Department of Agriculture, Aquaculture and Fisheries. It indicates weeds which can be affected by Callisto; however, herbicide performance is not guaranteed since factors such as weather, field history, stage of growth, herbicide rate, surfactant rate and differences in weed populations or biotypes can influence herbicide activity. Many species, like bracken fern, will require additional herbicide applications in future cropping cycles for full control. This product alone will not adequately control most grass species found in blueberry production.

Labelled Weeds

Control: Lamb's-quarters (pre-emergence), redroot pigweed, velvetleaf, wild mustard (pre-emergence), eastern black nightshade (post-emergence).

Suppression: Common ragweed

Research and Grower Experience

Susceptible (80%+ weed control): Burnweed, cow wheat

Suppressed (60-80% weed control): black bulrush, bracken fern, vetch, Canada goldenrod, narrow-leaved goldenrod, fireweed, old-field (blue) toadflax, violet species

Variable (inconsistent weed control): rush species, sedge species, New York aster, five-fingered cinquefoil, rough cinquefoil, spreading dogbane, blackberries (*Rubus* spp.), St. John’s wort, barrenberry, yellow loosestrife, birch, poplar, willow

Tolerant (limited to no weed control): hawkweed, sheep sorrel, maple, quackgrass, ticklegrass, bunchberry, 3-toothed cinquefoil, wild rose, lambkill, rhodora, lily/orchid spp.