



Bunchberry Control in Wild Blueberries with SPARTAN[®] Herbicide

SPARTAN[®] HERBICIDE (tribenuron methyl) is registered in Eastern Canada for the control of [bunchberry](#) (also called pigeon berry) in lowbush blueberries. Two distinct application timings for bunchberry control are registered on the product label, the original spring application and a User Requested Minor Use Label Expansion for a fall application. This factsheet has been prepared to provide growers with additional information on the use of this herbicide.

General SPARTAN[®] Herbicide Recommendations

For bunchberry control, apply SPARTAN[®] herbicide at 40 g/ha with 0.2% v/v AGRAL 90[®] (2 L AGRAL 90 per 1,000 L of water) in 150 to 250 L of water per hectare. Only one application can be made per cropping cycle (one application every 2-3 years) and SPARTAN[®] should not be tank mixed with any other pesticide. If rainfall occurs soon after application, control may be reduced. At least 4-6 hours of dry weather following application are needed to allow SPARTAN[®] to be absorbed by weed foliage.

SPARTAN[®] herbicide rapidly stops growth of bunchberry plants. However, typical symptoms (discolouration) of dying weeds may not be noticeable for 1 to 3 weeks after application, depending on growing conditions and weed susceptibility. Sprayed plants generally turn pinkish red and yellow, and eventually die (Figure 1). Degree of control and duration of effect depend on weed sensitivity, weed size, spray coverage and growing conditions. Favourable conditions following treatment promote activity of SPARTAN[®] herbicide while cold, dry conditions delay the activity. Weeds hardened off by environmental stress such as cold weather, drought stress or excessive heat may not be adequately controlled or suppressed, and regrowth may occur. The year following SPARTAN[®] application, some bunchberry regrowth can be expected, but densities will be much lower. It may be necessary to use SPARTAN[®] in following cropping cycles, to maintain the control of bunchberry.



Figure 1. Bunchberry reddening after treatment from SPARTAN[®]

Crop injury, in the form of plant stunting, has been noted following SPARTAN[®] applications. To reduce the risk of crop injury, it is advised that only bunchberry infested areas in blueberry fields be treated with SPARTAN[®]. The Spring application timing has a much higher risk for crop injury.

Under certain conditions such as prolonged cool weather temperatures or wide fluctuations in day/night temperatures just prior to or soon after treatment, temporary yellowing and/or crop stunting may occur. Fertilizers may help offset some of the blueberry stunting. Results from trials indicated that blueberry plants generally recovered faster and bunchberry control was often improved after fertilizer application. Differences, however, were not always statistically significant.

Since only one application is permitted per cropping cycle, a choice between the Spring and Fall application timings must be made. The Spring timing was the only option for producers in the past, but the narrow application window and potential for crop injury can be problematic. The Fall application timing combines improved weed control with a wider window of application. New Brunswick research has shown that the Fall application has significant advantages over the Spring timing, although both timings are fully registered and are discussed in detail below.

Spring Application Timing

Bunchberry is one of the first plants to emerge in the spring, usually emerging before blueberries. Generally, the only plant to emerge before bunchberry is wild lily of the valley. This plant is not to be confused with bunchberry. Wild lily of the valley forms a rolled, shiny green single leaf when it emerges and is somewhat heart shaped when unrolled. Bunchberry emergence is generally spread over a 4 to 5 week period. Shoots emerge from buds formed at the base of the previous year's stems and from buds on the spreading roots. These pinkish-white buds are easily observed early in the spring by sweeping back the upper 2.5 cm of the organic duff layer.

The buds later swell and a stem emerges with leaves curled upright around it, giving a cylinder-like appearance. These early stems and leaves tend to be reddish in color. Approximately 1 week later, the leaves begin to unfold away from the stem, and continue to do so for approximately another week until they have unfolded completely. As the leaves unfold, a small greenish-yellow flower becomes visible. When the leaves are fully unfolded, the enclosed flower turns a bright white. Not all plants, however, will flower.

The SPARTAN[®] application timing that has provided the most consistent control in the sprout year is from the time when the majority of the bunchberry plant leaves have unfolded to form a 45 degree angle off the stem until the leaves have just fully or nearly unfolded and the first white flowers are visible on the most advanced plants (Figure 2). This stage will generally occur 1 to 3 weeks after bunchberry plants first start to emerge. However,



Figure 2. Recommended SPARTAN[®] timing. Top/Early - leaves unfolded 45° off stem. Bottom/Late - first white blossoms showing

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this can vary depending on the weather. At this timing, there will still be some bunchberry plants emerging. **It is critical that blueberry growers carefully monitor their fields to determine when the bunchberry plants are at the optimal stage for herbicide application.** If spring applications of SPARTAN® are made too late, bunchberry plants turn red and remain so for the entire season. Reduced control can then be expected. If SPARTAN® is applied too early, bunchberry regrowth can be expected later in the season.

The tolerance of blueberry plants to SPARTAN® is limited during the spring and timing of application is critical in reducing the risk of crop injury. Results from research trials have indicated that if SPARTAN® + AGRAL 90 is applied before new blueberry stem regrowth reaches 2 cm (3/4 inch) in height, fruit bud numbers and yield will not be significantly affected; however, some stem height reduction with some yellowing and reddening of the blueberry leaves might be observed for 6 to 8 weeks after application (Figure 3). Occasionally, blueberry emergence may also be slightly delayed. Yields are not significantly reduced. This stage of blueberry development generally corresponds to the time when bunchberry is at the optimal stage of growth for application, but this may vary depending upon the field, year, method of pruning, etc. Applications made after this stage may induce severe crop stunting and reduce yields. Late spring applications have drastically reduced blueberry bloom and yield the following year.



Figure 3. Blueberry crop injury following SPARTAN® spring application.

Spring applications of SPARTAN® following fall mowing, fall burning, and early spring mowing have not influenced the effectiveness of SPARTAN®. Spring burning, however, has given variable results. In a few research trials, plots which were spring burnt and followed by a SPARTAN® application resulted in significant injury to the blueberry plants. Spring burning delays bunchberry emergence by burning off the buds, or plants which have emerged before the blueberries. As a result, by the time the bunchberry regrows to its optimal growth stage, blueberries may be more advanced than desired. At this advanced stage, blueberry plants are more sensitive to SPARTAN® and increased injury can result. In trials which resulted in injury, plots had been burnt late and hard. It is felt that an early, light burning likely would not result in blueberry injury. Further research will be conducted to verify this. As a precaution however, applications made to spring burnt fields are **NOT** recommended until further research is conducted.

Uneven spring burning can also influence the level of bunchberry control. Often the area directly under the burner head is burnt more intensely than the area between the burner heads. On rough fields where burner stacks tend to move up and down, uneven burning can also result. This uneven burning influences how fast bunchberry plants emerge. Bunchberry present in the lighter burnt areas emerge and reach the optimal application stage faster than the bunchberry present in the more intensely burnt areas. Proper SPARTAN® application timing can, therefore, be much more difficult on blueberry fields which have been burnt unevenly in the spring. Reduced and inconsistent results could therefore be expected under these circumstances.

Fall Application Timing

A fall application timing, evaluated through research conducted in New Brunswick, has been accepted for registration under the User Requested Minor Use Label Expansion program. This timing occurs one to four weeks after the completion of the blueberry crop harvest. Typically, this application would occur in September of the crop year. There are no restrictions on crop stage, although application should be made while bunchberry has active growth. Reddening of bunchberry may occur after harvest, especially in mechanically harvested areas (Figure 4). No effect of harvest type, either hand or mechanical harvest, was found in research trials. Higher levels of weed control in sprout year evaluations were noted following fall applications, as well as decreased visual crop injury. However, no difference in blueberry yield was measured in research trials between the spring and fall application timings. Typical results in the sprout year following a fall SPARTAN[®] application are shown in Figure 5.



Figure 4. Fall SPARTAN[®] Timing: Reddening of bunchberry after harvest

Conclusions

SPARTAN[®] application can be used to manage bunchberry in lowbush blueberries where two application timings are currently registered. The fall timing has a less restrictive application window, making the management of bunchberry in blueberry an easier process. For additional information on SPARTAN[®], please refer to the Product Label.



Figure 5. Untreated (left) and fall treated SPARTAN[®] (right) areas showing bunchberry control in the spring following application.