



## Integrating Burning into Your Pest Management Plan

In recent years there has been an increase in the amount of wild blueberry production that is pruned by mowing instead of burning. Increases in the cost of fuel, greater requirements for risk mitigation and a desire to conserve organic matter have been some of the reasons for this change. Mowing is less costly than burning but level fields are required. Level fields however, also permit; mechanical harvesting, greater precision when applying fertilizer, pesticide, or irrigation water and more consistent crop vigour throughout the field. This increase in production on level fields is the result of a rapid increase in blueberry production in regions with naturally level terrain and also the levelling of fields when required.

When burning is used as a pest management tool the field is burned only when required to manage pests and not every crop cycle. Burning is most effective for the management of pests that over winter in the field and attack plants in both the sprout year and the crop year. When fields are burned properly some of these pests are suppressed or even controlled. On farms where burning is no longer used controlling pests has become more dependent on other management tools such as pesticides.

The most common method of burning is to use a burner unit towed by a tractor and fuelled by oil or another fuel ([Fig. A](#)). Burning with straw was a traditional pruning method and is still done on a small scale. On level fields the old fruit stems can be mowed in fall using a sickle bar mower and the dry crop debris burned in the spring. A burner unit is used to burn the field perimeter and for igniting any small areas that do not burn naturally. This burning method reduces the amount of fuel required and is sometimes referred to as a 'free burn'. Small portable burning units are available for spot burning.



## Wild Blueberry Fact Sheet C.1.5.0

The effectiveness of burning for the management of pests is determined mostly by the intensity of the burn, a combination of both the maximum temperature achieved and the heating duration. An intense burn that ignites the surface debris is required for satisfactory control of some pests ([Fig. B](#)). Those that overwinter in the soil or at the soil surface require the greatest burning intensity for acceptable suppression. Factors that reduce the effectiveness of burning include; wet plants and weed debris, wet soil, high humidity, wind, excessive tractor speed and uneven terrain. The water content of stems increases in the spring which makes obtaining an intense burn more difficult for a delayed burn.

Other factors must also be considered when burning for pest management. Some pests, such as the blueberry fruit fly, redheaded flea beetle and blueberry thrips overwinter in the soil at depths that makes burning ineffective. A pest with a short life cycle such as powdery mildew can have multiple generations in a single season and quickly increase to a damaging level. For the rust diseases the source of the pest is outside of the field and therefore not controlled by burning. Nearby crop fields, or mowed sprout fields, are a source of pests for rapid reinfestation of burned fields. Naturally growing blueberries and other woodland plants are also a reservoir for blueberry pests.

Weeds may be suppressed by burning but the effectiveness is dependant on the type of plant. Burning is typically more effective for coniferous tree species and some shallow-rooted grasses. Many perennials and woody species can withstand burning and continue to grow from underground parts. Weed seed is produced in large amounts and is difficult to destroy once it is mixed into the soil surface. Many plants disperse large amounts of seed by wind so reinfestation occurs quickly. Using straw for burning that contains weeds and seed carried on harvesters are other ways new weed pests are introduced into a field.

When burning for the suppression of pests an intense burn is often required, so preparation and timing are important. Pests that overwinter in the soil are dormant and protected before fall burning occurs. Spring burning is more effective for these pests as long as emergence from the soil occurs prior to burning. Delayed spring burning can be used for the management of late emerging pests but burning in late May or early June may reduce fruit bud production in the current cropping cycle. It is possible to predict the emergence of many pests based on heat accumulation, typically degree days above 5 C. The emergence however of many blueberry pests occurs over a period of two to three weeks; therefore degree day calculations should be made for both first emergence and total emergence.

The first step in integrating burning into your pest management plan is to identify the pests affecting your field. For each pest you should clarify where it over winters and whether the sprout year, crop year or both years are affected. Pests may be present at low levels that are not economically important or present at levels where burning would be beneficial. If standardized scouting methods are used it is possible to evaluate the pest management program over successive cropping cycles. Start your integrated pest management program by burning every second or third cropping cycle. Monitor the severity of pest infestations and adjust your burning program as required. The intensity of the burn or the timing of the burn may have to be adjusted to manage some pests. The effectiveness of burning for the management of common blueberry pests is given in **Table 1**. Burning can be an effective pest management tool especially when supported by scouting and pest identification. There are restrictions and requirements for burning and a permit must first be obtained from the New Brunswick Department of Natural Resources. [Burning Requirements - NB Department of Natural Resources](#)

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Table 1. Pest	Source*		Over Wintering		Economic Damage		Value*	Comments
	Inside Field	Outside Field	Life Stage	Location	Sprout Year	Crop Year		
<b>Insect</b>								
<a href="#">Flea beetle</a>	+++	+	egg	leaf litter	yes	yes	✓✓✓	
<a href="#">Blueberry fruit fly</a>	+	+++	pupa	soil	no	yes	-	Over winters in soil, late emerging (after mid June). <b>Burning not effective.</b>
<a href="#">Leaf beetle</a>	++	++	adult	leaf litter	yes	yes	✓✓	
<a href="#">Red headed flea beetle</a>	+++	+	egg	soil	yes	yes	-	Over winters in soil, larvae feed on roots. Adults emerge in July. <b>Burning not effective.</b>
<a href="#">Red striped fireworm</a>	++	++	larvae	leaf litter	yes	yes	✓✓	<b>For production areas with multiple fields, migration from infested fields to burned areas reduces effectiveness.</b>
Sawfly	++	++	larvae	leaf litter	yes	yes	✓✓✓	
<a href="#">Spanworm</a>	++	++	egg	leaf litter	yes	yes	✓✓	
<a href="#">Spotted wing Drosophila</a>		++++	adult	protected areas	no	yes	-	Unknown if this pest over winters in NB. <b>Burning not effective.</b>
<a href="#">Strawberry root worm</a>	++	++	adult	leaf litter	yes	yes	✓✓	
<a href="#">Thrips</a>	+++	+	adult	soil	yes	no	✓	Over winters in soil, late emerging. <b>Late burning (mid June) improves control.</b>
<a href="#">Tip midge</a>	+	+++	pupa	soil	yes	no	-	Over winters in sprout fields. Very limited damage to crop year plants. <b>Burning not effective.</b>
<b>Disease</b>								
<b>Over Wintering</b>								
<a href="#">Botrytis blight</a>	++	++	weeds and leaf litter		no	yes	-	Only crop year affected. <b>Burning not effective.</b>
<a href="#">Exobasidium fruit spot</a>	+++	+			no	yes	-	Damage occurs in crop year. <b>Burning not effective.</b>
<a href="#">Leaf rust</a>		++++	leaf litter		yes	no	-	<b>Burning not effective.</b>
<a href="#">Mummy berry</a>	+	+++	mummy berries		no	yes	✓✓	
<a href="#">Powdery mildew</a>	+++	+	stems and leaf litter		yes	yes	✓	<b>Burning reduces incidence in sprout year.</b>
<a href="#">Red leaf</a>	+++	+	in rhizome		yes	yes	-	<b>Burning does not eradicate infection from rhizome.</b>
<a href="#">Septoria leaf spot</a>	+++	+	stems and leaf litter		yes	yes	✓✓	<b>Burning reduces incidence in sprout year.</b>
<a href="#">Valdensinia leaf spot</a>	+++	+	leaf litter		yes	yes	✓✓✓	Infestation may reoccur from outside the field
<a href="#">Witches broom</a>		++++	in rhizome		no	no	-	Fir trees are the source for blueberry infection. <b>Burning not effective. Burning does not eradicate infection in rhizome.</b>
<b>Weed</b>								
Woody	+	+++	seeds and established plants		yes	yes	✓	<b>Only above-ground parts are burned.</b>
Perennial	++	++	seeds and established plants		yes	yes	✓	<b>Only above-ground parts are burned.</b>
Annual	++	++	seeds		yes	yes	✓	<b>Only seeds at soil surface are burned.</b>
*Effectiveness of burning	This rating is for a spring burn that ignites all surface debris. For production areas with multiple fields, pest migration from infested fields to burned areas reduces the effectiveness of burning for the management of some pests.							
-	Burning is not effective for management of this pest.							
✓	Burning is not very effective for pest control or requires specific timing to improve effectiveness.							
✓✓	Aids in pest control when integrated with other management tools.							
✓✓✓	A high level of control is possible with an intense burn.							
+, ++, +++, +++++	(+ small source of pest) (++ moderate source of pest) (+++ large source of pest) (++++ total source of pest)							