Integrated
Cranberry Crop
Management
for Wisconsin

Cranberry

Crop Management Newsletter

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Intrepid Registered for use on Cranberries

The US EPA has approved a section 3 label for the use of Intrepid 2F insecticide for use on cranberries. Intrepid is a new chemistry effective against lepidopteran pests of cranberry. It is labeled for blackheaded fireworm, sparganothis fruitworm, and spotted fireworm. The label allows ground and aerial application.

Statements on the label, however, restrict the use of Intrepid because of endangered species concerns around Karner Blue Butterfly habitat. The label does not allow its use within one mile of sandy habitats that support wild lupine plants in a number of counties in central and northern Wisconsin, including many of the major growing regions. WSCGA is working in concert with other groups to have the label amended to allow use of Intrepid in Wisconsin. The adoption of a habitat conservation plan by Wisconsin DNR was designed to prevent endangered species labeling issues. However, the label was issued with the restrictions that must be followed.

Growers can obtain a copy of the label from their dealer. As progress is made in the future we'll include the information in the newsletter along with WSCGA.

Sources of phosphorus

Pure phosphorus is never found free in nature, but it is widely found in combination with other minerals. Apatite is an impure tri-calcium phosphate and is an important source of industrial phosphorus. Phosphorus is very poisonous. About 50 mg would constitute a lethal dose. Pure white phosphorus is kept under water as it takes fire spontaneously in air. Upon contact with skin it can cause severe burns.

The ultimate source of most phosphate fertilizer is phosphate rock. These are lime-rich sedimentary rocks that became enriched in P under shallow marine conditions. Currently U.S. phosphate mining takes place in Florida, North Carolina, Idaho and Utah. Some phosphate mining is underway in Ontario, Canada. Mined phosphate rock is not a suitable fertilizer because it is almost insoluble. To make a suitable fertilizer the phosphate rock is finely ground and then treated with acid. Treating with sulfuric acid produces superphosphate. Treating with phosphoric acid produces triple superphosphate. Reacting phosphoric acid with ammonia produces ammonium phosphate.

Phosphorus and phosphate

In fertilizer phosphorus exists as the phosphate ion ($H_2PO_4^-$ or $HPO_4^=$). The middle number on the fertilizer bag represents the amount of available phosphate represented as P_2O_5, even though no P_2O_5 exists in the bag. It would be simpler and less confusing to express phosphorus on an elemental basis, but the oxide analysis has become so entrenched that it would be difficult to change.

To convert between phosphate and phosphorus use the following conversion factors:
Phosphorus (P) = phosphate (P_2O_5) x 0.44
Phosphate (P_2O_5) = phosphorus (P) x 2.29

Phosphate fertilizers

Fertilizers used by cranberry growers can contain phosphorus in one of four different formulations: Triple superphosphate, regular superphosphate, monoammonium phosphate, or diammonium phosphate. In order for a plant root to take up a phosphate ion it must be in the soil solution (liquid fraction of the soil). It cannot be bonded to any other ion. Properties of phosphate fertilizers are shown in Table 1.

Table 1. Agricultural phosphate fertilizers.

Name of fertilizer	Chemical formula	Fertilizer analysis	Water solubility
		%	%
Ammonium polyphosphate	$NH_4H_2PO_4 + (NH_4)_3HP_2O_7$		
Liquid		10-34-0	100
Dry		15-62-0	100
Diammonium phosphate	$(NH_4)_2HPO_4$	18-46-0	>95
Monoammonium phosphate	$NH_4H_2PO_4$	11-48-0	92
Ordinary superphosphate	$Ca(H_2PO_4)_2 + CaSO_4$	0-20-0	85
Rock phosphate	$3Ca_3(PO_4)_2 \cdot CaF_2$	0-32-0	<1
Triple superphosphate	$Ca(H_2PO_4)_2$	0-46-0	87

Orthophosphate versus polyphosphate. Sources of phosphorus containing the $H_2PO_4^-$ or $HPO_4^=$ ions are called orthophosphates. Polyphosphates contain a mixture of orthophosphate and some long-chain phosphate ions such as pyrophosphate, $(HP_2O_7)_3^-$. Commercially produced polyphosphate contains about 50% orthophosphate and 50% long-chain phosphate compounds.

Claims that polyphosphates are superior to orthophosphates exaggerate their ability to partially chelate or combine with certain micronutrients and hold them in an available form. Research has not shown that this difference increases yield or nutrient uptake in most soils. Polyphosphate ions react with soil moisture to form orthophosphates relatively rapidly (1-2 weeks). On almost all soils orthophosphate and polyphosphate fertilizers are equally effective.

Water solubility. The amount of water soluble phosphorus in the different sources of phosphate varies considerably (Table 1). When phosphorus is broadcast and incorporated or topdressed the amount of water solubility makes little or no difference. All commonly used phosphorus fertilizers presently sold in Wisconsin (except rock phosphate, which is not recommended) contain at least 85% water soluble phosphorus.

Liquid versus dry. Compared to conventional dry fertilizers, liquid fertilizers are easier to handle, mix, and apply. Despite claims to the contrary, research has shown that liquid phosphate does not improve fertilizer phosphorus availability or recovery. It is the soil interactions that control phosphorus uptake, not the physical form of the fertilizer applied.

Blossom time Insecticide Applications

In the midst of bloom, many growers may be pondering what course of action they will take if faced with the dilemma of treating for insect pests during bloom. As most growers know, treating with our conventional chemical insecticides during bloom is not recommended due to pollinators actively foraging the cranberry blossoms. Many of our conventional chemicals can be toxic to pollinators if applied improperly near blossom time. There are alternatives for growers to consider if faced with treating insect problems during bloom.

Growers should consider using Bt products (DiPel, Biobit, Agree, MVP, etc.). Bt's are quite specific. Most can provide good control of lepidopteran insects (caterpillars) and offer low risks to beneficial insects. Bt products should be applied when caterpillar larvae are young and small. Bt's don't offer the quick knockdown of insects like conventional insecticides; they have to be ingested by the larvae and act as stomach poisons. Larvae generally stop feeding within a few hours of feeding on Bt treated foliage and die within a few days. Treatments may have to be repeated if there is a continuous insect hatch. Consult product labels for correct rates. Remember that not all Bt's are labeled for use on cranberry.

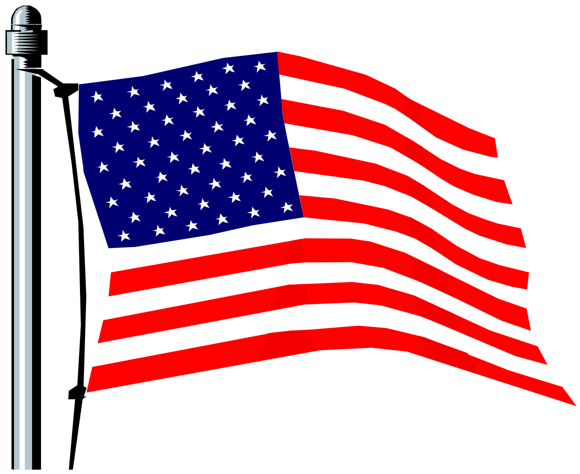
Try products like Pyrenone. Pyrenone contains a naturally occurring insecticide, pyrethrum, derived from pyrethrum flowers grown in Africa. It also contains piperonyl butoxide as a synergist. Evening applications of the contact poison can offer growers good control of some insects such as blackheaded fireworm. The product is broken down by sunlight and residue levels are low if applied the prior evening. Use 8-12 ounce per acre rates to knock down pest levels until the bees can be removed. More than one application may be needed to get you through the blossom period.

You should avoid chemical insecticide treatments during bloom. Wettable powder formulations may be particularly hazardous, since they may not always completely dissolve, and can leave powdery residues on plants that can be carried back to foraging pollinator hives. Also, stickers should be avoided since they can extend the time that toxic residues are present, increasing the potential of pollinators being injured.

When using Bt's or pyrenone, always make applications late in the evening. Bees don't forage in darkness, and applications made during this time can minimize pollinator hazard. Before making applications, run sprinkler systems 10 to 15 minutes to discourage pollinator activity. This chases any foraging insects from the beds, and can also help reduce the chances of phytotoxicity associated with some types of pesticide application methods. Run sprinkler systems in the morning. Bees will be discouraged from entering the beds when vines are wet, and the extra water should help reduce residues to levels safer for pollinators.

Finally, whatever pest management measures you employ, if bee hives are present be sure to keep the beekeepers informed. They can work with you to avoid bee hazard in case of a situation requiring immediate pest suppression.

Leroy Kummer, Ocean Spray Cranberries.



SUMMER FIELD DAY

Mark your calendars for Wednesday August 6 and plan to attend the Cranberry Summer Field Day at Elm Lake Cranberry Co. in Cranmoor. Exhibits will open at 8:30 am. WSCGA will hold a business meeting at 1:15 pm. Registration materials are available from WSCGA. The cost for lunch is $8.00. Lunch should be ordered before July 25. Cranberry field day is co-sponsored by WSCGA and the University of Wisconsin-Extension.

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Department of Horticulture
1575 Linden Drive
Madison, WI 53706-1590

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