

## **EFFECTIVENESS AND USE OF THE NEW INSECTICIDES, ASSAIL, INTREPID, AND SUCCESS AGAINST APPLE PESTS IN QUEBEC**

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### **Success**

**General Characteristics and Use-** Success is an insecticide that was derived from a naturally occurring soil microorganism, *Saccharopolyspora spinosa*, which is a new species of Actinomycete. This insecticide is made up of a tetracyclic ring system and the compound is called Spinosyn A. In the United States, this product is classified as a "Reduced risk insecticide" because of the following criteria: reduced environmental load, reduced risk to workers, reduced risk to beneficial insects, reduced toxicity to non-target organisms in the environment, no groundwater concerns, excellent efficacy, and compatibility with integrated pest management programs. This material is relatively safe to the environment because it degrades rapidly in the soil, does not contaminate ground or surface water, and is not toxic to mammals and birds. Success affects the nervous system, and its toxic effects are new and unique compared to other insecticides. Currently, no other pests resistant to other kinds of insecticides have been cross-resistant to this compound. Success has a relatively short residual life (5-7 days, and this length of activity is not increased at higher dosages. Therefore, it is better to apply lower rates more frequently than to use higher rates applied at longer intervals.

**Effectiveness and Activity-**Success has excellent activity against the obliquebanded leafroller, and also has some activity against the apple maggot and codling moth, although it is not as effective against these pests as standard organophosphates, such as Guthion and Imidan. Success does not provide good control of the oriental fruit moth, lesser appleworm, and plum curculio.

### **Intrepid**

**General Characteristics and Use-**Intrepid is a member of the general class of chemicals called Diacylhydrazines. These materials are commonly known as MAC's (molt accelerating compounds). Insects affected by this material begin to molt (shed their skin) and cannot complete this cycle. They can not get free of their old skin, and stop feeding within 1 to several days and eventually starve to death. Intrepid must be eaten to be effective. Since it can take some time to stop feeding, this compound should be applied before larvae hatch. It is probably most effective against young larvae. This material is not systemic within apple foliage, and expanding foliage and terminals must be resprayed to insure effective coverage of a tree.

**Effectiveness and Activity-**Intrepid is very effective against the oblique-banded leafroller and also controls the oriental fruit moth, codling moth, and lesser appleworm. It is not effective against the apple maggot and plum curculio.

## **Assail**

**General Characteristics and Use-**The common chemical name for Assail is Acetamiprid and this material is a member of the Neonicotinoid class of insecticides. It is formulated as a 70% wettable powder. Assail is stable in sunlight, and stable in a range of humidity from 20-95%. It is also stable under high and low temperatures. This material is rapidly absorbed into the leaf and has translaminar activity. Because of this property, it controls pests on the sprayed and unsprayed leaf surfaces. Therefore, it will control insects feeding on the underside of the leaves, which are difficult to spray directly. It is not absorbed by the fruit and has good residual activity on apple fruit and foliage. This material acts at single site and affects the insect's nervous system. It causes the insect to become restless and go into convulsions. This inhibits feeding and kills the insect fairly quickly.

**Effectiveness and Activity-**Assail is an excellent material for controlling caterpillars and worms, and in fruit it is primarily targeted against codling moth, oriental fruit moth and lesser appleworm. However, this material also has a fairly broad spectrum of activity and will also control a range of other pests: European apple sawfly, white apple leafhopper, apple maggot, rosy apple aphid and other aphids, spotted tentiform leafminer, and San Jose scale. This material is not very effective against the plum curculio and does not control obliquebanded leafrollers.

### **Control of the Obliquebanded Leafroller Intrepid and Success**

Intrepid and Success have proven to be very effective in managing the obliquebanded leafroller in problem orchards in NY because populations are resistant to organophosphates and pyrethroids. However, resistant field populations of leafroller larvae in NY are also cross resistant (10-20X) to Intrepid, even though this material still provides good control in most orchards. Currently, no cross-resistance to Success has been observed in field populations of obliquebanded leafrollers. Because of the potential proliferation of resistance to all classes of insecticides, we currently recommend that different classes of insecticides be used against the overwintering and summer generations of leafroller larvae to minimize selection pressure for a particular class of chemicals. The most common strategy in NY is to apply Intrepid at petal fall to control overwintering and/or the subsequent summer generation of OBLR. Then Success is applied at first egg hatch (300DD base Temp=43°F) after the first moth catch of the summer generation, which usually occurs during the first week in July. Another spray is usually required 10-14 days later to completely control larvae from the summer generation. Many field tests conducted in NY have shown that it is difficult to control fruit damage from overwintering obliquebanded larvae. Therefore, the primary reason for treating overwintering larvae is to have some impact on the population levels of the subsequent summer generation. Usually, on average treating both generations of leafrollers in commercial apple orchards results in an average fruit damage at harvest that is 2-4% lower than if only the summer generation is controlled.

### Potential Use Strategies for New Insecticides in Quebec Apple Orchards

**Success** can be used early in the season at pink or petal fall to control overwintering obliquebanded larvae and again during July and until mid-August to control newly hatched larvae from the summer generation. Success during this time of summer will also have some impact in controlling apple maggots and codling moths.

**Intrepid** can also be used at either pink or petal fall to control overwintering obliquebanded larvae and use of this compound at this time will also control the first generation of oriental fruit moths. This material can be used again during the summer from late June until about the first of August to control the summer generation of obliquebanded leafrollers. The first spray of Intrepid against the summer generation of leafroller larvae should be applied just before the first hatch of eggs so that foliage will be covered before larvae emerge.

**Assail** is a more broad-spectrum material than Success or Intrepid. Assail can be used at pink through bloom to control rosy apple aphids, the first generation of oriental fruit moths, and the first generation of spotted tentiform leafminers. It can also be used again during late summer (mid-July) until September to control: codling moths, oriental fruit moths, apple maggots, white apple leafhoppers and spotted tentiform leafminers.

### Suggested Use Strategies for New Insecticides in Quebec Apple Orchards

**Assail** can be applied at the pink bud stage to control the first generation of oriental fruit moth, the first generation of spotted tentiform leafminer, and rosy apple aphids in susceptible varieties. Assail used at this time may also have some effect on tarnished plant bugs, although efficacy data is very difficult to interpret.

**Intrepid** can be applied at petal fall to control overwintering obliquebanded leafroller. Since this material will not control plum curculio, it will have to be supplemented with another material if this pest is a serious problem in treated orchards.

**Success**-Two applications of this material can be applied with the first spray timed to coincide with the initial egg hatch of the summer generation of obliquebanded leafrollers (Usually the first week in July) and a second spray 10-14 days later. These sprays may also have some impact on apple maggot and the second generation of codling moth.

**Assail**-can be used as necessary during the remainder of the season. When this material is used during August, it will control white apple leafhoppers, spotted tentiform leafminers, oriental fruit moths and codling moths, and apple maggots. Assail has a fairly long residual period and if control of oriental fruit moth is adequate throughout the first two generations, it should not be necessary to spray this material after September 1<sup>st</sup> to control the third generation that is often active during September and October.

