Products containing imidacloprid for Agricultural Uses have been classified "Restricted Use" in New York State

Imidacloprid: Best Management Practices for Long Island, New York

Agricultural Uses

Cornell Cooperative Extension of Suffolk County

New York State Department of Environmental Conservation

Bayer CropScience

Best Management Practices
For the Use of Admire® 2F Insecticide In Potatoes and Vegetables Grown on Long Island, NY

Protect crops and the environment, RESPONSIBLY.

Introduction

Imidacloprid-based insecticides have been available to the New York commercial agricultural industries since 1995. For potato and vegetable use, this active ingredient is sold under the trade names Provado® 1.6 Flowable Insecticide for foliar applications and Admire® 2 Flowable Insecticide for soil or growing media application. These products have become especially important in agricultural production and are highly effective for control of difficult-to-manage species such as Colorado potato beetle, cucumber beetles, green peach aphid, and melon aphid. Admire® and Provado® have largely replaced several other insecticides formerly used to control these species. The products replaced are either no longer available, less effective, or have higher mammalian acute toxicity[1]. Since groundwater monitoring began on Long Island in 1997 as a condition of New York State registration, imidacloprid has been detected in several shallow wells in Suffolk County, NY. Detections of imidacloprid remain far below established levels for health concerns according to the US Environmental Protection Agency (USEPA) and the New York State Department of Environmental Conservation (NYSDEC) and below an action level agreed upon by the NYSDEC and Bayer CropScience (BCS). For all of these reasons, everyone involved with the use and stewardship of Admire® and Provado® should implement Best Management Practices to ensure continued access to these products in the environmentally sensitive region of Long Island.

When applied to the root zone, Admire® is systemic in plants offering weeks to months of efficacy. When initially registered in 1995 in potatoes, a single treatment at planting replaced six to twelve foliar sprays over the life of a crop (with lower CPB populations now, currently one to three applications are replaced), representing a significant savings in labor and insecticide costs and mitigated drift and exposure issues for applicators. Admire® insecticide has a relatively short 12-hour re-entry interval (REI) following application, which represents an improvement over older materials with 24 to 96-hour REIs. Because it is soil-applied, an important exception is noted on the label under *Agricultural Use Requirements* indicating, 'If the product is soil-incorporated, the Worker Protection Standard, under certain circumstances,

allows workers to enter the treated area if there will be no contact with anything that has been treated.'

The mode of action of Admire® complements insecticide resistance-management programs as an alternative to organophosphate, carbamate, and pyrethroid chemistries. For the Colorado potato beetle in particular, Admire® fits well into a resistance management scheme, in rotation with other registered foliar insecticides having different modes of action. These can be applied to successive generations within the growing season.

The majority of Admire® used in commercial production on Long Island is for potatoes, applied in-furrow at planting providing systemic control of Colorado potato beetle. It is undoubtedly the primary reason severe problems with green peach and especially, melon aphids are now rarely, if ever, seen in this crop. Admire® has an added benefit of long-residual control against unpredictable migrations of potato leafhopper.

Admire® has also become important in cucurbits to control cucumber beetles, as an alternative to regular sprays with pyrethroids or carbamates. Systemic applications have been favored partly because beetle infestations are notoriously unpredictable, appearing suddenly in large numbers and creating substantial losses when beetles transmit the pathogen causing bacterial wilt. Admire® is usually applied in-furrow for direct-seeded crops or as a drench for transplanted vine crops. On Long Island, Admire® is occasionally used on other vegetable crops such as tomatoes.

According to the Extension Toxicology Network Pesticide Information Profile for imidacloprid[2], "There is generally not a high risk of groundwater contamination with imidacloprid if used as directed. The chemical is moderately soluble, and has moderate binding affinity to organic materials in soils. However, there is a potential for the compound to move through sensitive soil types including porous, gravelly, or cobbly soils, depending on irrigation practices." Soils or sub-soils around much of Long Island are generally well-drained, sandy or sandy loams and leaching models run by the New York State Department of Environmental Conservation at maximum use rates indicate the potential for movement to subsurface water. In order to maintain the continued registration and uses of these valuable products to the agricultural community on Long Island and to minimize the risk of imidacloprid movement to Long Island's sole-source aquifer, the following Best Management Practices for the use of Admire® in agricultural production are offered to guide responsible management of the product. Guidelines for other uses of imidacloprid in greenhouse and nursery crops, turf care and arboriculture are addressed in other Best Management Practices available from dealers, Bayer CropScience or Cornell Cooperative Extension.

Store and handle concentrated material carefully.

- Place packages and containers inside secondary containment such as plastic bins to reduce the chance of spillage.
- Mix and load over a properly designed and maintained containment pad if available.
- For permanent mixing/loading facilities, follow the guidance of the "Natural Resources Conservation Service Conservation Practice Standard for Agrichemical Mixing Facility New York" document NY702, which requires the facility be located outside the 100 year flood plain and wetland areas, 100 feet from private wells and surface water bodies, and 500 feet from wells used for the public water supply.
- For limited on-farm, non-permanent locations, choose a level area as far as possible (at a minimum maintain a distance of 25 feet, with at least a 15-foot vegetative strip) between the mixing/loading area and potential surface-to-groundwater conduits such as field sumps, uncased wellheads, sinkholes, recharge basins and bodies of water.
- In extremely vulnerable conditions (e.g., steep slope, hard surface areas, and areas without grasses or vegetation) which would lead into a potential groundwater recharge area, extreme caution should be taken or mixing/loading should not occur in this area.

Clean up spills promptly and dispose of properly. Every farm should maintain a spill cleanup kit on site with personal protective equipment and cleanup materials, including: gloves, coveralls, boots, goggles, a shovel, broom, dustpan, and heavy-duty storage bags. In the event of a liquid spill, promptly spread an absorbent material such as sawdust or cat litter. When there is a high likelihood of surface or groundwater contamination, dam around the spill. Do not allow the material to wash into drains, recharge basins, or similar areas where there is a high risk of leaching or runoff. Sweep or shovel the absorbent material into a heavy-duty plastic bag. Repeat this procedure a number of times to ensure thorough decontamination. For areas where soil needs to be removed, immediately shovel the saturated soil or top 2-3 inches of soil into a heavy-duty bag and cover area with fresh topsoil. Imidacloprid-contaminated soil and absorbent material in quantities under 500 lbs can be disposed of through the normal waste stream. For larger spills and for more information regarding disposal and spill guidelines, contact Bayer CropScience at 1-800-334-7577, Chemtrec at 1-800-424-9300, or the State Department of Environmental Conservation at either 1-800-457-7362 (to report spills) or 631-444-0320 (for questions regarding spill clean-up).

Identify the pest or problem before treating. Insect pests, plant diseases and/or other factors sometimes cause similar symptoms. For example, potato leafhopper injury might be mistaken for fertilizer or herbicide damage. Be sure of the identity, presence and severity of the target pest before applying any insecticide. In the case of products such as Admire® that must be applied in a preventative manner to be effective, it is recommended that applicators identify a historical and recurring pest problem before use.

Consider alternative insecticides or biological controls where available, suitable and effective. While Admire® use has been important in certain situations, some labeled insect pests are easily controlled with other products. Foliar applications of Provado® 1.6F or other insecticides may be more appropriate than systemic treatments with Admire® - be sure to include adjuvant (such as a spreader-sticker) for waxy insects or foliage and strive for good coverage. Contact Cornell Cooperative Extension or your distributor for a copy of *Alternatives to Admire* and consult the Cornell Pest Management Guidelines for Vegetables[3]. Please note that Provado® is not registered for use on cucurbit (vine) crops. For resistance management reasons it is important not to depend solely on the use of Admire® or any one product or mode of action for insect control. Do not apply Provado® 1.6F sprays to the same insect population or crop following an earlier Admire® application.

Incorporate cultural or other non-chemical controls. Where pest pressure is high, trench traps and/or propane flamers have been useful as border treatments for Colorado potato beetle. Crop rotation is very effective. Other strategies for potatoes are outlined in Cornell Cooperative Extension's Pest Management Guidelines for Vegetables[3]. For vine crops, some cucumber cultivars are less prone or attractive to cucumber beetles. Row covers may be appropriate to protect small plantings during establishment.

Calibrate and maintain application equipment to be sure treatment rates are accurate for the area, rows or flats treated. When applying to individual flats, be sure drenches are of appropriate volume and rate and use careful irrigation practices to avoid leaching insecticide from treated flats. Use no-drip nozzles (valves) and be sure application equipment is in good working condition without leaks.

Limit the frequency of use. With Admire® and all crop protection products, always utilize sound Integrated Pest Management practices such as scouting and action thresholds, where available, for determining product selection choices and need for application. In fields where Colorado potato beetle populations have been or are likely to be low, such as in rotated or isolated fields, Admire® use may not be necessary where suitable alternative crop protection products or methods exists. However, the need for monitoring aphid and leafhopper densities will be enhanced in case infestations of these pests appear, since plants are no longer protected.

Experience indicates that some growers do not consistently have cucumber beetle infestations and might not need preventive Admire® treatments. Frequent inspection (twice weekly) is needed for untreated plants, especially during the early growth (pre-runner) stage. Where it is essential to manage bacterial wilt, vectored by cucumber beetles, foliar applications of any currently available product may not be as effective as the systemic Admire® treatment.

Limit application rates. Admire® rates established on product labeling were derived through extensive field testing across the U.S. and around the world. Labeled rate ranges were provided based on the length of residual control required, difficulty of control experienced in specific pests, and crop densities and size.

Because of the unique geology of Long Island and the vulnerability of the sole-source aquifer due in part to the storm water management system required on the island, growers on Long Island should consider using the lowest labeled applications rates of Admire®. While there may be somewhat shorter residual control, use of lower rates will reduce the amount of material applied per area thus decreasing the potential risk of off-site movement. For potatoes, where Colorado potato beetle pressure is low, growers are encouraged to consider using the lowest label rate of 13.8 fl oz/A (based on 34" rows). This rate will still control leafhoppers and aphids though the length of residual control will be reduced.

For cucurbit (vine) crops, consider limiting Admire® use to 16 fl oz/A (1.1 fl oz/1000' of row based on 36" row spacing). Again, pest species to be controlled, crop density, plant size and required length of residual control should be considered for determining the rate used. Admire is effective for treatment of labeled transplants in flats such as cucurbits and fruiting vegetables, but consult Cooperative Extension for latest information on application rates. Additional research is planned to help clarify the proper rates necessary for maintaining control of specific pests on Long Island for different row spacings and for growers able to treat on an individual-plant basis.

Application method and timing. Avoid applying Admire® to the uncovered soil surface. For direct-seeded vine crops or potatoes, apply Admire® in-furrow below the soil surface in contact with the seed or seed piece in a 2 - 8" band (i.e., the width of the planter shoe or furrow) and cover completely. Because of the unique conditions on Long Island, avoid narrow dribble applications that concentrate material in a narrow strip. Avoid inadvertent off-target application or spillage at the row ends. Do not apply Admire® through aerial application equipment.

Application records. Keep good records, as required by statute, including target pest(s) and weather conditions (for outdoor treatment) at application and for the next 48 hours**.**

Take the utmost care to avoid leaching of the material during and after application. Do not apply Admire® to soil or growing medium that is frozen, saturated or waterlogged or directly to water or intertidal areas. Apply when there is little chance of heavy rain within the next 24 hours. For flats, irrigate lightly for at least 3 days to allow uptake and minimize risk of leaching. When used on erodible soils, best management practices for minimizing runoff should be employed. Well maintained grassy buffer areas have been shown to significantly reduce the

runoff of pesticide residues from mixing/loading locations and from treated areas in the field. In field conditions, maintain a minimum distance of 25 feet, with at least a 20-foot dense grass filter strip for slopes less than 1 (one) percent, between treated areas and field sumps, uncased wellheads, sinkholes, recharge basins and bodies of water. The filter strip width should be increased 1.5 feet for each additional percent of slope increase. For example, in an area with 7% slope, the filter strip width should be increased to 29 feet. More information on filter strip and maintenance standards is available through the USDA Natural Resources Conservation Service, Conservation Practice Standards for New York (Filter Strip - Strip, New York, code 393s) from local NRCS offices or the internet[4]. In extremely vulnerable sites (e.g., steep slope without dense grass cover) which lead to potential groundwater recharge areas, applications should be avoided altogether.

Shallow groundwater areas. In areas where the water table is shallow or where a very high risk of leaching is expected (such as loamy sand soils), consider using other materials for insect control.

Best Management Practices Training Sessions: All users of Admire are encouraged to attend training sessions and/or educational programs. Contact Cornell Cooperative Extension or your local distributor for dates and locations.

1) Imidacloprid acute toxicity: rat oral LD50= 450, dermal LD50 >5000 mg/kg
2) Internet accessed 5/15/03 at http://ace.ace.orst.edu/cgi-webglimpse/mfs/services/data/info/extoxnet?link=http://ace.orst.edu/info/extoxnet/pips/imidaclo.htm&file=/services/data/info/extoxnet/pips/imidaclo.htm&line=114#mfs
3) Pest Management Guidelines for Vegetables, Cornell Cooperative Extension, Ithaca, NY updated annually.
4) Filter Strip - Strip, New York, code 393s. 1997. USDA Natural Resources Conservation Service, Conservation Practice Standards for New York. Accessed from internet at http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=NY. For Suffolk County, click on Suffolk, then under eFOTG select Section IV - Practice Standards and Specifications, then under B. Practice Standards select Filter Strip - Strip (AC) (NY393s).

IMPORTANT!

ALWAYS READ AND FOLLOW LABEL DIRECTIONS. This bulletin is not intended to provide all the information necessary for the use of this product. Before using the product, read and carefully observe the precautionary statements, directions for use, restrictions, storage and disposal statements and other pertinent information on the label. For additional product information, call toll-free 1-866-99BAYER (1-866-992-2937) or visit our Web site at BayerCropScienceUS.com, or contact Cornell Cooperative Extension of Suffolk County, 423 Griffing Ave., Riverhead, NY 11901 (1-631-727-7850).

Every effort has been made to provide correct, complete and up-to-date pesticide best managment practices (BMPs). Nevertheless, changes in pesticide regulations occur constantly and human errors are still possible. These BMPs are not a substitute for pesticide labeling. Please read the label before applying any pesticide. The use of trade names does not imply endorsement by Cornell Cooperative Extension. Applicators should be sure to verify current NY pesticide labels and registration status at http://pmep.cce.cornell.edu/pims/current/.

Cornell Cooperative Extension in New York State provides Equal Program and Employment Opportunities.

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