IPM IMPACT NEWSLETTER – No. 2 2023

Welcome to the second IPM Impact newsletter for 2023. **If** you have received this newsletter then you are eligible to access the IPM Impact database through your company which has a subscription worldwide. If you have not yet subscribed then please go to the following link: https://www.ipmimpact.com/register

Following registration your account will then need to be activated, in which case please contact Mike Griffin (mjgriffin1978@gmail.com) for this or any other issue you might have.

About IPM Impact

Over the years, IPM Impact has been carrying out research into many different products and ingredients, examining their effects on the various pests that damage crops, as well as on other beneficial organisms that are very useful, whether for hunting pests or for pollinating plants. Based on the experience built over 25 years, we have been studying the impact of Plant Protection Products (PPPs) on these beneficial organisms, including on bumblebees. In an ongoing process, this data has then been included in the database and now includes over **14,000 entries** for the effects of around **400 active ingredients** on over **130 different beneficials**, and a further **200 entries** for their efficacy on **21 pests**.

Entries in the database are the results of trials held with a more realistic approach. Unlike IOBC trials, which require testing of the effects of fresh residues on various organisms, mainly on glass plates or plastic dishes, IPM Impact prefers to conduct trials on existing populations, as is done in practice, under worst case scenario conditions. For this reason you will quite often find that results in the IPM Impact side effects database differ from those found in IOBC or EPPO-based research. IPM Impact's research can therefore be a very useful source for those in advisory roles, but also aims at scientists that are involved in registration.

Recently entered data

Further progress has been made in making the results of IPM Impact's work visible to subscribers through publishing this data on the website's side-effects database. Since the last newsletter, particular emphasis has been put on expanding the data regarding the efficacy of PPP's on various pests, including *Echinothrips americanus*, *Tetranychus urticae*, *Sitobion avenae*, *Tenebrio molitor*, *Myzus persicae*, *Brevicoryne brassicae*, *Oidium lycopersicum* and *Trialeurodes vaporariorum*.

As for products and active ingredients, recently entered data includes such products as Benevia (cyazypyr), Vertimec (abamectin), Teppeki (flonicamid), Trebon (etofenpyrox) Shirudo (tebufenpyrad), Mevalone (geraniol + eugenol + thymol), Closer (sulfoxaflor), Siltac (polymers of silicons, **see below**), Agritrap (seaweed alginate), Flipper (unsaturated carboxylic acids) and Oikos (azadirachtin). In particular, work has been done to add data regarding the effects of PrevAm (orange oil) on a variety of beneficial organisms, both predators and parasitoids. There are also ongoing efforts to distinguish between various products of the same active ingredient, by populating entries with formulations and tradenames.

Introducing Siltac SF

Siltac SF is part of a current trend to reduce the use of chemical plant protection products in order to reduce the risk to human health and the environment. Producing pesticide residue-free food is an important aspect of this trend, as is tackling the problem of resistance to more traditional methods of plant protection. Siltac SF is an unusual plant protection product in that it does not contain traditional active ingredients as pesticides do, is far safer due to leaving no residue and can be applied without a pre-harvest interval. It also therefore provides a solution for protecting plants and crops for which there is no existing product that is registered for use in a particular territory, for controlling pests that have developed a resistance to traditional insecticides and acaricides (such as spider mites and aphids) while also being of use against a wide range of pests due to its physical mode of action.

Siltac SF is a product of ISA Nanotech, a company based in the Netherlands.

Note: There are other compounds on the market that may be, or claim to be, similar to Siltac SF. These products' side-effects on beneficials and efficacy against pests **have not** yet been determined by IPM Impact.

Mode of action

As has been mentioned, Siltac SF does not contain traditional active substances of chemical pesticides. Instead, the product is based on the unique Three-dimensional Polymer Network. After application, a crosslinking process creates a net-like polymeric structure on body surfaces of pests. This silicone net structure, appearing as a thin, sticky film, forms on the body surfaces of the pests and immobilises them. It blocks their physical life functions in multiple ways and quickly leads to the death of herbivorous insects and mites.

Crops and usage

Siltac SF has been tested only on a limited number of crops, and it is recommended that it is tested for phytotoxicity on a small number of plants before any widespread spraying of the product. It is, however, highly recommended for use on ornamentals and has been tested on hard and soft fruit, (greenhouse) vegetables, ornamental plants and grains. Appropriate precautions and guidance for using Siltac SF is listed on the website. Siltac SF has shown to be very effective in controlling spider mites, rust mites, aphids, scaled insects, psyllids, whiteflies, and especially thrips.

Application

There are directions for use provided on the product website..

- Always spray on a dry crop.
- Siltac SF needs to dry quickly for optimal effect, only use if no rain is expected within 6 hours, and avoiding using before a dew night.
- Do not mix with other substances.
- Application can be repeated only after 7 days.
- Siltac only has an effect on living, moving pests, and therefore has no effect on eggs.

The **Siltac SF label** provides more specific guidance depending on the crop and the target pest as the dilution rate can vary. The product can also have a potential risk of injury to foliage and petals if applied at the incorrect stage of growth of the plant or crop.

Siltac SF and EU regulations

Siltac SF is not a chemical plant protection product but rather a device for physical pest management, according to Regulation (EC) No. 1107/2009. The monomers of silicone copolymers included in the product already meet the requirements set out in the Regulation EC (No.) 1907/2006 of the European Parliament and European Council. These points mean that Siltac SF does not require registration as a chemical plant protection product.

IPM Impact studies into Siltac SF

The side-effects of Siltac SF on several biological arthropods were tested at four different dose rates. Specifically, Siltac SF was tested at the application rates of 7, 10, 15, or 20l/ha for toxicity on the predatory mites *Phytoseiulus persimilis*, *Amblydromalus limonicus* and *Amblyseius andersoni,* the soil-dwelling predatory mite *Macrocheles robustulus,* the aphid midge *Aphidoletes aphidimyza,* the predatory bug *Macrolophus caliginosus* and the minute pirate bug *Orius laevigatus.* In the case of *P. persimilis, A. limonicus and M. robustulus,* the toxicity of Siltac SF was calculated separately for the mite's eggs and mobile stages. Siltac SF's toxicity was furthermore calculated for each life stage (egg, larva, protonymph, deuteronymph, adult – both female and male) of *A. andersoni*. Siltac SF was also tested on *A. aphidimyza* larvae, *M. caliginosus* and *O. laevigatus* nymphs, and adults. The results ranged from no to moderate toxicity for all tested arthropods, indicating Siltac SF as a safe PPP for several important biological agents. Moreover, efficacy trials were conducted against the pea aphid *Acyrthosiphon pisum,* the cabbage aphid *Brevicoryne brassicae,* and the green peach aphid *Myzus persicae.* The product showed slight efficacy against the pea and cabbage aphids but high efficacy against green peach aphids, for the tested application rates and under trial conditions.

Finally, the topical application of Siltac SF on R&D commercially sized colonies of the buff-tailed bumblebee *Bombus terrestris* presented a slight reduction in the number of workers but no reduction in the formation of new queens. Therefore, closing and protecting the hive before treatment is recommended in order to avoid any harmful effects when spraying Siltac SF on or near the bumblebees' hives.

Conclusively, Siltac SF may be used in IPM schemes according to the results that are available and published in IPM Impact's side-effects database. However, it must be noted that the presented results were achieved using specific dose rates which should be taken into account before incorporating them into such schemes.

External links

ISA Nanotech website: https://isananotech.com/en/

For more information, please contact ISA Nanotech via: info@isananotech.com