

IOBC/wprs Bulletin, Vol. 34, 2008

Working Group "Landscape management for functional biodiversity",
Proceedings of the meeting at Bordeaux (France), 14 - 17 May, 2008. Edited by
Walter Rossing
(ISBN 978-92-9067-208-1) [vii + 136 pp.].

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Residues of acetamiprid in leaves of *Aesculus hippocastanum* and effects on the horse chestnut leaf miner (*Cameraria ohridella*) following trunk spraying
Schenke, D., Jäckel, B. & Schmidt, H. 1-9

Abstract At the beginning of flowering in 2006, the neonicotinoid acetamiprid was sprayed on trunks of twenty and eighty-year-old horse chestnut trees at different application rates. Sampling took place at the end of the first and second leaf miner generations. To estimate mortality, efficiency and parasitism, living, dead and parasitized leafminers were counted. Acetamiprid residues were only found in the first samples taken after application, which showed high deviations. All variants showed low efficiency of acetamiprid independently of the application rate. The parasitism rate of chalcidoid wasps was generally higher in the treated variants than in untreated trees.

Who benefits from low-input pesticide use within the tritrophic system: crop – aphid – predator?

Schumacher, K. & Freier, B. 10-17

Abstract: Effects of low-input pesticide use on the tritrophic system crop – aphid – predator were investigated in field and laboratory studies. The field study was carried out in a conventional farm of the high-input crop protection area Magdeburger Boerde between 2004 and 2006. The field was divided into two halves during the whole period of investigation representing low- and high-input variants. One half was characterized by 50% reduced pesticide doses and the other one by good plant protection practice (100%). The crop rotation of this field was spring wheat (2004), winter wheat (2005) and peas (2006). Before and after insecticide application densities of aphids and their predators on plants (counts) as well as activity densities and diversity of carabids on ground (pitfall trappings) were investigated. Aphids were insufficiently reduced by insecticides in the low-input variant. In all three years significantly more aphids were found in the low-input variant in comparison to the high-input variant. The abundance of aphid specific predators, e. g. adults and larvae of coccinellids and syrphid larvae, was positively affected by the low-input pesticide use. In all years significantly more aphid predators were observed in low-input-field than in high-input-field. But no clear effect of reduced insecticides use on abundance, structure of dominance, and diversity of carabids was observed. It is concluded, that the potential of natural regulation was enhanced by reducing the insecticide input but the regulation itself was not improved. Thus, aphids were benefited to a greater extent than their predators from reduced insecticide use. The laboratory studies were carried out in climate chambers investigating the tritrophic system weed – aphid – predator by applying different doses of insecticides. In contrast to the field study aphids could be sufficiently reduced by low-input insecticide doses. The doses of insecticide could be reduced even more by utilization of the predator potential to receive a good pest control. But its difficult to transfer the results of laboratory studies to field conditions. It could come to an overestimation of the potential of natural regulation by a predator.

Impact of low-input pesticides usage on spider communities with special regard to accumulated effects

Volkmar, Ch., Schumacher, K. & Müller, J. 18-25

Abstract: Reduction programs are designed to reduce chemical plant protection to a minimum. The intensity of plant protection can be measured by the treatment frequency index (BI). This study focused on the ecological impact of a long-term reduction of chemical plant protection in commercial crop cultures and investigated the effects of a 50% reduction on *Araneae* at three fields in Ochtmersleben (Saxony-Anhalt). Each field was divided into two halves representing a 100% and a 50% application variant. The analysis was based on qualitative and quantitative parameters such as activity density, species diversity, pattern of dominance as well as other computed parameters. The results indicate that the impact of insecticides on the spider population was the strongest when the insecticides were applied the earliest. There were no significant shifts in dominance structures between both variants. Some endangered spider species were only sampled in the 50% variant. In summary, a 50% long-term reduction of chemical plant protection has positive effects on spider coenoses.

- Effects of different control measures against the olive fruit fly (*Bactrocera oleae* (Gmelin)) on beneficial arthropod fauna. Methodology and first results of field assay
 González-Núñez, M., Pascual, S., Seris, E., Esteban-Durán, J. R., Medina, P., Budia, F., Adán, Á. & Viñuela, E. 26-31
Abstract: Beneficial arthropod fauna was monitored in test plots of an olive grove in Madrid under four different control strategies against the olive fruit fly: trichlorfon bait sprays (trichlorfon + protein hydrolysate Nu-Lure[®]), spinosad bait sprays (Spintor Cebo[®]), kaolin sprays and mass-trapping (Easy-trap[®] + Nu-Lure[®]). A beating method was used to sample arthropods from the five plots along 2005. Bait treatments (spinosad or trichlorfon) and mass-trapping did not cause significant effects on populations of beneficial arthropods, but a reduction of parasitoids and predators was observed in samples from plots sprayed with kaolin. However, a longer time period of study will be necessary to confirm the effect of the different control strategies on the evolution of arthropod populations.
- Impact of Success Bait (a.i. spinosad) against *Rhagoletis cerasi* on insect fauna in field test (Abstract) Barić, B., Pauković, M., Bertić, D. & Pajač, I. 32
 Abstract only
- Effects of bait sprays to control the European cherry fruit fly (*Rhagoletis cerasi* L.) on aphid predators (Abstract)
 Vogt, H. & Köppler, K. 33-34
 Abstract only
- Earwigs in fruit orchards: phenology predicts predation effect and vulnerability to side-effects of orchard management
 Gobin, B., Moerkens, R., Leirs, H. & Peusens, G. 35-39
Abstract: Earwigs, *Forficula auricularia*, are important natural enemies of a variety of orchard pests. In recent years, numbers of earwigs have declined in both organic and IPM orchards. To understand what factors affect earwig population dynamics, we conducted a detailed phenological survey of earwigs in orchards. Earwigs were counted in artificial refuges in orchard trees. Earwigs appear in the trees from the beginning of June onwards as third instar nymphs, moult into fourth instar nymphs 3 weeks later and reach adulthood early July. At this point, earwigs show an inexplicable reduction in population. Adults remain present until end of October. In most orchards, a small second brood is produced in summer, and this has a positive impact on population size in fall. Comparison of earwig and pest phenologies show that earwigs play important roles in controlling summer pests rather than spring pests. Earwigs are at risk for side-effects of foliar spray applications from June to October, and for soil management or herbicide treatments in winter and early spring.
- Side effects of pesticides on the European earwig *Forficula auricularia* L. (Dermaptera: Forficulidae) Peusens, G. & Gobin, B. 40-43
Abstract: Earwigs are key predators of orchard pests, but show large inter-orchard differences in population dynamics and numbers. In apple and pear orchards, only sufficiently large earwig populations can contribute to pest control. As earwigs have a single generation per year, a potential effect of pest management is likely to influence population dynamics. In an extended lab test the side effect of dried residue of 37 registered plant protection products (twenty-seven insecticides, 1 biological insecticide, 2 oils, 1 surfactant, 1 protectant and 1 herbicide) were evaluated on adult *F. auricularia* L.. Classified upon their Mode of Action (MoA) 9 of the 17 tested classes of insecticides proved to be harmless, 7 slightly and 1 moderately harmful. For various test products sub-lethal effects such as reduced co-ordination, spastic behaviour were noticed shortly after application. Depending on the active ingredient the earwigs either recovered or died eventually. We still need to verify the validity of our results in a replicated trial and hope to extend the test to juvenile stages and field test.

About the presence and abundance of beneficials in overwintering sites of *Anarsia lineatella* (Lepidoptera: Gelechiidae) in peach orchards of northern Greece

Damos, P. & Savopoulou-Soultani, M. 44-50

Abstract: A report is given about the presence and abundance of beneficials in overwintering sites of *Anarsia lineatella* Zeller (Lepidoptera, Gelechiidae). The study was conducted in two important regions of peach production in Northern Greece (Veria 40.32°N and Velvendo 40.16°N). For 3 years (2005-2007) hibernacula of overwintering larvae were collected from conventional and IPM peach orchards and transferred to the laboratory in order to ascertain the level and type of beneficial activity. The presence of two Braconid parasitoids was high, causing a significant high larval mortality. In some cases almost 57% of inspected samples were parasitized. In addition, a comprehensive number of beneficial mites were also observed inside the hibernacula. Despite the fact that some of them are not directly linked to the predation of *A. lineatella*, they had a high presence during the years. Moreover, most of the observed species belonged to the families Phytoseiidae, Pyemotidae and Tydeidae. The observations attest the fact that the overwintering sites of *A. lineatella* constitute an important microenvironment of beneficial activity. Considering the increasing interest in biological control and that all the above-mentioned beneficials are subjected to mortality induced by pesticides, the different strategies for the control of *A. lineatella* in Northern Greece peach orchards are discussed.

Is the use of some selected insecticides compatible with two noctuid endoparasitoids: *Hyposoter didymator* and *Chelonus inanitus*?

Medina, P., Morales, J.J., González-Núñez, M. & Viñuela, E. 51-59

Abstract: Studies were conducted in the laboratory to evaluate the toxicity of three insecticides (imidacloprid, fipronil and natural pyrethrins+piperonyl butoxide) at field rates on pupae and adults of *Hyposoter didymator* and *Chelonus inanitus*, both of them solitary endoparasitoids of several noctuid larvae. Topical application on pupae and residual, topical and ingestion bioassays on adults of the two parasitoid species were used to assess percentages of adult emergence and life-span, in case of treated pupae and life-span for adults. Out of the three compounds tested, only fipronil significantly reduced the life-span of emerged adults, after topical treatment of *H. didymator* and *C. inanitus* pupae (90 and 75%, respectively). The life-span of treated adults was significantly reduced in both parasitoid species by all the insecticides tested irrespective of the uptake route, with the exception of *C. inanitus* adults treated with imidacloprid. Fipronil was clearly the most toxic insecticide.

The extended laboratory test guideline for *Aphidius rhopalosiphi*: some areas of debate relating to the methodology

Mead-Briggs, M. 60-65

Abstract: After several years of slow evolution, a final draft version of the extended laboratory test guideline was put forward by the *Aphidius* Ring-Test Group in 2006. However, upon wider circulation, some proposals made in the guideline were challenged. These related to a) why only female wasps were being evaluated; b) the relevance of the repellency assessments and what happens where settling rates on the treated plants were poor; c) which of the surviving wasps should be selected for the reproduction assessments; only those classed as 'alive and unaffected', or also those appearing to be 'affected'? It is hoped that by explaining the reasons behind certain decisions that were made and by presenting additional data, we can now move forward and finalise the long-overdue publication of the guideline.

Pesticides selectivity list to beneficial arthropods in four field vegetable crops

Jansen, J.P., Hautier, L., Mabon, N. & Schiffers, B. 66-77

Abstract: Selectivity of pesticides to beneficial arthropods is a key data for the implementation of IPM program. In the context of field vegetable crops, a set of 16 fungicides, 16 herbicides and 13 insecticides commonly used in Belgium were tested on 5 indicator species: the parasitic hymenoptera *Aphidius rhopalosiphi* (De Stefani-Perez) (Hym., Aphidiidae), the aphid foliage dwelling predators *Adalia bipunctata* (L.) (Col., Coccinellidae) and *Episyrphus balteatus* (Dipt., Syrphidae) and the ground-dwelling predators *Aleochara bilineata* (Col., Staphylinidae) and *Bembidion lampros* (Col., Carabidae).

Pesticides were tested according to a testing scheme including a first assessment on inert substrate and, for products that were toxic, a second assessment on natural substrate. The effects of the product were assessed on basis of onion fly pupae parasitism reduction for *A. bilineata* and on

basis of corrected mortality for the 4 remaining species. According to the final results obtained at the end of this testing scheme, the products were listed in toxicity classes: green list if effect $\leq 30\%$, yellow list $30\% < \text{effect} \leq 60\%$ and orange list $60\% < \text{effect} \leq 80\%$. Products with toxicity higher than 80% on plants or on soils, or that reduce parasitism more than 80% on soil were put in the red list and are not recommended for IPM.

Results showed that all fungicides and herbicides were included in the green list except tebuconazole and boscalid + pyraclostrobin that were labeled as yellow for *A. bipunctata*. In opposite, no foliar insecticide was totally selective for all beneficial tested. However some products are in green list for one or several species. Soil insecticides were all very toxic for ground dwelling arthropods and classed in red list.

In conclusion, fungicides and herbicides tested are compatible with IPM programs. For foliar insecticides, some treatments can be used carefully according to the selectivity. But for soil insecticide treatments, their toxicity raise the question of their use in IPM programs in vegetables and the need of new compounds or development of alternative pest control programs.

Concerns and solutions in non-target arthropod regulatory risk assessment of plant protection products

Chaton, P.F., Vergnet, Ch. & Alix, A.78-84

Abstract: According to the Directive 91/414/EC, the risks of plant protection products to non-target arthropods have to be assessed in the field and outside the field (off-field area). For the products that require a refined risk assessment, an evaluation of all risk types relies on many extrapolations from available experimental data, especially for the off-field assessment. Due to these extrapolations, some concerns could occur in the assessment, like the questionable relevance of the tested species. The introduction of off-field specific topics in the existing tests and the use of model could be helpful to solve these concerns.

Toxicity of certain pesticides to the predatory mite *Euseius finlandicus* (Acari: Phytoseiidae)

Broufas, G.D., Pappas, M.L., Vassiliou, G. & Koveos, D.S.85-91

Abstract: The acute and residual toxicity of certain widely used pesticides in plum orchards in Greece to the predatory mite *Euseius finlandicus* were determined with laboratory and semi-field experiments. The acute toxicity of the tested products was evaluated under laboratory conditions using detached bean leaf disks which were sprayed with a Potter spraying tower calibrated to approximately 1.5 mg wet deposit per cm². Protonymphs of *E. finlandicus* were transferred on the sprayed leaf disks and subsequently pre-imaginal survival, adult survival and fecundity were determined according to the IOBC protocols. Based on mortality and fecundity, the pesticides carbaryl, cypermethrin, acetamiprid, methomyl and deltamethrin were considered as harmful, diflubenzuron slightly harmful and *Bacillus thuringiensis* as harmless to *E. finlandicus*. The residual toxicity of the tested pesticides to *E. finlandicus* was evaluated using 3 year old potted plum trees (cv. Vanilia) which were sprayed till run-off with a hand sprayer and maintained in the field. At regular time intervals of 3, 7, 10, 15, 20 and 25 days after spraying, leaves were detached from the plants and protonymphs of *E. finlandicus* were transferred on them. Based on the mortality percentages, the pesticides carbaryl, cypermethrin, acetamiprid and methomyl were highly toxic to the predator for more than two weeks, whereas diazinon for 7 to 10 days. These results could be useful for the selection of suitable pesticides for use in integrated pest management programs in orchards in northern Greece.

Side effects of pesticides used in vineyards in the Aegean region on the predatory mite *Typhlodromus perbibus* Wainstein & Arutunjan (Acari: Phytoseiidae) under laboratory conditions

Göven, M.A. & Güven, B.92-95

Abstract: In this study the side-effects of pesticides on predatory mite *Typhlodromus perbibus* Wainstein et Arutunjan were tested under laboratory conditions during the period 2002-2004. The susceptible life stages of *T. perbibus* were exposed to fresh residues on glass of five commonly used pesticides in vineyards. The tests were conducted according to the standard laboratory test method of the IOBC/WPRS working group "Pesticides and Beneficial Organisms" (Blümel et al., 2000). In laboratory tests, Thiovit (a.i. sulphur) was the only compound demonstrating moderately toxic effect. Ekalux (a.i. quinalphos), Folidol M (a.i. parathion-methyl), Korvin (a.i. carbaryl) and Antracol (a.i. propineb) showed harmless effect.

Effects of ten pesticides to *Anystis baccarum* (Acari: Anystidae)

Bostanian, N.J. & Laurin, M.-C. 96-100

Abstract: *Anystis baccarum* (L.) (= *Anystis agilis* (Banks)) is a common predatory mite recently identified in apple orchards and in vineyards of Quebec, Canada. Studies of its susceptibility to pesticides used in these crops need to be carried out to encourage integrated pest management programs in these crops. A laboratory evaluation of the following insecticides: methoxyfenozide (Interprid® 2F), acetamiprid (Assail® 70WP), thiamethoxam (Actara® 25WG), imidacloprid (Admire® 24%), spinosad (Tracer® 44.1%), λ -cyhalothrin (Warrior® T), and carbaryl (Sevin® XLR) showed that residues of λ -cyhalothrin, and carbaryl were highly toxic to *Anystis baccarum* in 48 h Petri dish bioassays. The label rate of λ -cyhalothrin is 9.9 g A.I. /ha applied in 540 liters of water (0.0184 g A.I./L) which would be 26 fold the estimated LC₅₀ (0.0007 g A.I./liter) for this predator. The field rate for carbaryl is 1.06 kg A.I. / ha again applied in 540 liters of water (1.960 g A.I./liter) and it would be 784 fold the estimated LC₅₀ (0.0025 g A.I./liter). The other five insecticides, evaluated were non-toxic. Among the three fungicides evaluated mancozeb (Dithane® M-45) was slightly to moderately toxic. Whereas kresoxim-methyl, (Sovran® 50WG) and sulphur, (Microscopic sulphur® 92WP) were non toxic.

Influence of some insecticides and acaricides on beneficial mites and on *Coccinella septempunctata* (Coleoptera; Coccinellidae) larvae

Olszak, R. W. & Sekrecka, M. 101-108

Abstract: During the period 2004-2007 several experiments have been conducted under laboratory and field conditions to assess the influence of a broad range of insecticides and acaricides on different beneficial mites and on *Coccinella septempunctata* larvae.

In the laboratory the toxicity of the insecticides spinosad, methoxyfenozide and triazamate were investigated on the predatory mite *Typhlodromus pyri* (Phytoseiidae). In other laboratory experiments the influence of the pesticides spiroadiclofen, thiamethoxam, spinosad, propargite and novaluron were investigated on *Coccinella septempunctata* larvae.

In the field, the side-effects of triazamate, thiacloprid, pirimicarb, novaluron, spinosad, indoxacarb and fenitrothion were studied on the population of *Typhlodromus pyri*. Additionally, in the field, the toxicity of the acaricides hexythiazox and fenpyroximate were investigated on the predatory mite *Zetzellia mali* (Stigmaeidae). In a third experiment, carried out in an abandoned orchard, the influence of propargite, pyridaben, cyhexatin, and fenitrothion were studied on the population of beneficial mites belonging to the families Phytoseiidae, Tydeidae, Stigmaeidae and Tarsonemidae.

The results of investigations indicate that most of used insecticides were harmless to the predatory mite *Typhlodromus pyri* and to the larvae of *Coccinella septempunctata*, with the exception of spinosad being harmful to phytoseiid mites. Similar data were received when the acaricide fenpyroximate was used on population of *Zetzellia mali*.

In the field experiment, carried out in an abandoned apple orchard, all the used chemicals were toxic to beneficial mites.

Effect of the entomopathogenic fungus *Lecanicillium muscarium* on the predatory mite *Phytoseiulus persimilis* as a non-target organism

Donka, A., Sermann, H. & Büttner, C. 109-112

Abstract: To combine different beneficial organisms in biological control systems with entomopathogenic fungi, it is necessary to examine their compatibility. Regarding the entomopathogenic fungus *L. muscarium*, the objective of the study was to determine the potential risk of our strain V 24 for the most important antagonist *Phytoseiulus persimilis*. In standardised trials in petri dishes and on potted plants, the effect of the fungus on predatory mites at different spore densities (2×10^6 and 2×10^7 sp./ml) was assessed.

We could show that predatory mites can indeed pick up spores from the leaf surface. At spore densities of 2×10^6 and 2×10^7 sp./ml however, only few predatory mites died on plants (4,2 respectively 12,7%). There were no differences to the control regarding the development of the mite population on the plant.

Effects of *Beauveria bassiana*, *Heterorhabditis bacteriophora*, *H. megidis* and *Steinernema feltiae* on the Mediterranean fruit fly *Ceratitis capitata* and the very sensitive braconid *Psytalia concolor* in the lab

Medina, P., Corrales, E., González-Nuñez, M., Smagghe, G. & Viñuela, E. 113-121

Abstract: Laboratory experiments were set up to measure the susceptibility of the pest *Ceratitis capitata* and the braconid *Psytalia concolor* (very sensitive to pesticides), to three commercial nematodes available in Spain [maximum field recommended rate (MFRC): 100 infective juveniles (IJ)/cm²]: *Steinernema feltiae*, *Heterorhabditis bacteriophora*, *H. megidis* and the entomopathogenic fungus *Beauveria bassiana* (MFRC 1000 ml cp/hl; 2.3 x 10⁹ conidia/ml cp). The neurotoxic malathion, used worldwide for the control of *C. capitata* was used as positive standard (150 ml ai/hl).

When nematodes were applied to the pupation medium of *C. capitata* (vermiculite, 10% humidity), *S. feltiae* and *H. bacteriophora* were as effective as malathion, inhibiting practically 100% of adult emergence at a 2-fold MFRC and 75% r.h. Efficacy of nematodes was much higher at 75% r.h. than at 30% r.h. irrespective of the dose used. The three nematodes decreased the progeny size of *P. concolor* when the parasitoid parasitized *C. capitata* L₃ larvae, treated with the MFRC under 75% r.h., but significant reductions were only scored for *S. feltiae*.

The fungus *B. bassiana* was tested on adults of the pest and the parasitoid (75% r.h.; 25°C) by residual contact, topical application and ingestion, as well as by treatment of the oviposition gauze and direct spray on the pest, and *via* contaminated hosts on the parasitoid. It did not cause mortality at 3 days or affected reproduction of *C. capitata* (malathion gave 100% mortality), except when applied at a 10-fold MFRC at the oviposition gauze (significantly decreased fertility by 21.7%). The biopesticide did not cause mortality on *P. concolor* in contrast with malathion (100%), but it significantly decreased its beneficial capacity by residual contact or *via* treated host larvae (lower progeny size) or by ingestion (lower number of attacked hosts).

Aged-residue method for evaluating toxicity of plant protection products to *Stethorus punctillum* (Weise) (Coleoptera: Coccinellidae)

Nienstedt, K.M. & Miles, M. 122-127

Abstract: *Stethorus punctillum* (Weise) (Coleoptera: Coccinellidae) is known as an obligate predator of spider mites. Currently there are no widely recognised laboratory methods for testing the effects of plant protection products (PPP) to this species. Here we present a method for evaluating the toxicity of PPP under extended laboratory conditions or as a persistence (aged residue) study, combining field applications with laboratory bioassays. *S. punctillum* larvae were exposed to treated apple leaf disks and their development through to pupation and adult emergence monitored. An assessment of reproduction was also performed. Example data corresponding to control, methoxyfenozide and fenoxycarb treatments are presented.

Chlorantraniliprole (DPX-E2Y45, DuPont™ Rynaxypyr®, Coragen® and Altacor® insecticide) - a novel anthranilic diamide insecticide - demonstrating low toxicity and low risk for beneficial insects and predatory mites

Dinter, A., Brugger, K., Bassi, A., Frost, N.-M., Woodward, M.D. 128-135

Abstract: Chlorantraniliprole (DPX-E2Y45, DuPont™ Rynaxypyr®) is a new anthranilic diamide insecticide with a novel mode of action. Rynaxypyr® activates insect ryanodine receptors causing impaired regulation, paralysis and ultimately death of sensitive species at rates of 10 to 60 g Rynaxypyr®/ha. In worst-case Tier 1 glass plate tests the two indicator species, *Aphidius rhopalosiphii* and *Typhlodromus pyri*, were not sensitive to either Coragen® or Altacor® at up to 750 g Rynaxypyr®/ha, the maximum rate tested indicating low risk for non-target arthropods. Low risk for non-target arthropods was confirmed in a wide range of tests with several other species. Overall, DuPont™ Rynaxypyr® and the formulations, Coragen® and Altacor®, were demonstrated to be safe to numerous beneficial non-target arthropod species or to have a rather low and transient impact and therefore will be excellent tools for use in integrated pest management (IPM) programmes.

Influence of organic matter on bio-availability of two pesticides and their toxicity to two soil dwelling predators (Abstract)

Hautier, L., Mabon, N., Schiffers, B. & Jansen, J.-P. 136

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- Different methods of application – Different laboratory test strategies (Abstract)
 Norr, C., Baier, B. & Schenke, D. 137
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- Assessment of side-effect of water-soluble nitrogen fertilizers applied as foliar spray
 on the parasitic wasp *Aphidius rhopalosiph* (DeStefani-Perez) (Hym.;
 Aphidiidae)
 Dantinne, D. & Jansen, J.P. 138-142
- Abstract:** In several crops, nitrogen fertilizers can be routinely applied as foliar spray at period when beneficial arthropods are active and, thus, exposed to these products in a same way as pesticides. If side-effects of pesticides on beneficial arthropods are well documented, little is know about possible negative impact of nitrogen formulations on beneficial arthropods. In this research, the effects of 3 nitrogen fertilizers applied as foliar spray were tested on the parasitic wasp *A. rhopalosiph* in the laboratory on glass plates and on plants. This species was selected because it is very sensitive to pesticides and used as "standard species" for ecotoxicological tests in the context of registration at European level. It is also a key beneficial arthropod for aphid control. The nitrogen formulations tested were a nitrogen solution (nitrate, urea and ammoniac in solution), pearled urea (liquid urea) and Nutriforce®. These fertilizers are widely used in crops such as cereals or potatoes. They were tested at their maximum recommended field rate, corresponding to an application of 15-20 N units/ha according to the product.
- The nitrogen formulations were first tested on glass plates, according to the IOBC Tier I testing scheme. All formulation exhibit a high toxicity, mainly due to mechanical effects, with re-crystallization of urea and high hygroscopicity of residue. Results clearly showed that Tier I test methodology was not adapted for nitrogen formulation at field rate.
- Nitrogen formulations were further tested on plants in the laboratory, according to IOBC Tier II testing scheme. Fertilizers were applied on barley seedlings infested with cereal aphids. Both mortality and repellence were followed through a 48h period and aphid mummies were left to developed 10-12 days. They were counted by plants and assessed for parasite emergence. Both lethal (mortality) and sublethal effects (aphid mummies production and emergence) were used to calculate reduction in beneficial capacity, compared to a water-treated control. When they were applied on barley seedlings, the three nitrogen formulation were only slightly toxic for adult wasp, with a minimum of 14% corrected mortality with the nitrogen solution and a maximum of 44% with pearled urea. However, a strong reduction in female capacity was observed with 50.4 aphid mummies/female for control and only 13.4, 9.0 and 17.8 aphid mummies/female with pearled urea, nitrogen solution and Nutriforce®, respectively. Emergence rate of the mummies were comparable to control values. Due to effects on reproduction, the reduction of beneficial capacity were comprised between 69.8% and 85.4%.
- According to IOBC toxicity classes, Nutriforce® was considered as moderately harmful (class 3) and pearled urea and nitrogen solution as harmful (class 4). Magnitude of the effects was similar than for classical insecticides, indicating that foliar nitrogen application can have a biological signification for beneficial arthropods and probably also on other organisms exposed to foliar spray.
- Field toxicity of four acaricides on the predatory mites *Amblyseius andersoni* (Chant) and *Euseius stipulatus* (Athias-Henriot) (Acari: Phytoseiidae) in apple orchard at Northwest of Portugal (Abstract)
 Rodrigues, J. R. & Torres, L. M. 143
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- Influence of teflubenzuron residues on the predation of thrips by *Iphiseius degenerans* and *Orius laevigatus*
 Scott Brown, A., Simmonds, M. & Blaney, W. 144-145
 Abstract only
- Study on the side-effects of three pesticides on the predatory mite, *Phytoseius plumifer* (Canestrini & Fanzago) (Acari: Phytoseiidae) under laboratory conditions
 Noii, S., Talebi, K., Saboori, A., Allahyari, H., Sabahi, Q. & Ashouri, A. 146-151
- Abstract:** The predatory mite, *Phytoseius plumifer* is one of the most abundant natural enemies of phytophagous pests and mites especially in the north of Iran. Experiments were carried out to

assess the compatibility of commonly used pesticides against phytophagous pests in order to determine pesticides which have the least side-effects on the predator and are more suitable for using in integrated control programs. In this study the side-effects of three pesticides (abamectin, malathion and phosalone) were evaluated in laboratory. The laboratory tests were done using the ‘detached leaf’ method. Percentages of predator mortality and oviposition rate were assessed. The effect of the pesticides at the maximum field rates on *P. plumifer* adults was above the upper tolerance threshold. All three tested pesticides caused 100% mortality within 24 hours after treatment and were classified as harmful for the predator. Therefore they are not compatible with the predator within an integrated control program. Effects of abamectin, malathion and phosalone even at 0.1 recommended field rates were above the upper tolerance threshold. The residue test revealed that these pesticides caused 100% mortality within 3, 10 and 15 days after treatment. According to a dose-response test, the LR₅₀ of phosalone amounts to 1.48 µg a.i./cm² for the adult predator. The rate of fecundity decreased as the rate phosalone increased. These results suggested that *P. plumifer* can be used as a biological indicator in the safe shelters.

Special Topic

The need for taxonomists of pest and beneficial organisms - results of an inquiry at the meeting of the IOBC working group “Pesticides and Beneficial Organisms” in Berlin in October 2007

Schmitt, G. 152-156

Abstract: An inquiry has been carried out on the meeting of the IOBC working group “Pesticide and Beneficial Organisms” in October 2007 to record the international need for taxonomists of pest and beneficial organisms by specialists on phytopathology and biocontrol. The questionnaire consisted of 5 questions on 19 proposed taxonomic groups at different taxonomic level. The outcome of the inquiry includes a list of the taxonomic groups ranked by the numbers of asked persons working with and showing on which groups taxonomic support is needed. Most of the respondents require the support of professional taxonomists from external institutions. According to the statements, the presence of taxonomists has been summarized for each of the countries the respondents came from. Overall, taxonomists were frequently missed or not known, and the majority of the asked persons agreed with the claim for more permanent positions for taxonomist.