

Building a selectivity list of plant protection products on beneficial arthropods in open field: a clear example with potato crop Hautier, L.¹, Jansen, J-P.¹, Mabon, N.², Schiffers, B.²

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Abstract: In order to promote IPM and the use of selective pesticides in open fields, a program was initiated to provide a selectivity list to pesticide users. The first approach was with potato crop, because of intensive use of pesticides and interest of IPM in this crop in Belgium.

For this, the following beneficial arthropods species were selected: *Aphidius rhopalosiphi* (De Stefani-Perez) (Hym.; Aphidiidae), representative of parasitic Hymenoptera, *Adalia bipunctata* L. (Col.; Coccinellidae) and *Episyrphus balteatus* (De Geer) (Dipt.; Syrphidae), both representative of leaf dwelling predators. These are all aphid specific enemies, the main pest problem in potato in Belgium.

The toxicity of 20 fungicides and 12 insecticides used in potato during the period of potential exposure of these beneficials were assessed on these species according to methods previously developed. The tests included a glass plate test on inert surface according to IOBC standard and an extended-lab test on natural substrate (barley seedlings for *A. rhopalosiphi* and French bean seedlings for *E. balteatus* and *A. bipunctata*). The spray apparatus was calibrated to deliver a pesticide residue deposit similar to a field application. A chemical dosage of residue was realized at each test on natural substrate to validate the application and follow pesticide degradation during exposure.

According to results of both tests, products were rated as “Green” (harmless), “Yellow” (slightly harmful), “Orange” (moderately harmful) and “Red” (harmful). List were build-up according to toxicity results of the products and split in 4 periods of use depending on, aphid natural enemies presence and their importance in the field: period one (until 10 June) and four (after 31 July), no or limited, period 2 (10-30 June) exposure of aphid parasites and period 3 (July), exposure of leaf dwelling predators. These periods were based on field observations of aphids and natural enemies carried out since 1994 in the context of potato pest advisory systems.

A first list was compiled and distributed to farmers in 2004 and updated in 2005 with new compounds. The results show that it is currently possible to combine throughout the growing season an effective plant protection program with pesticides that are selective to main aphid natural enemies.