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Wirkung von Spinosad auf die Regulierung des Kartoffelkäfers (*Leptinotarsa decemlineata* Say) im Ökologischen Landbau

The Effect of Spinosad on the Control of the Colorado Potato Beetle (*Leptinotarsa decemlineata* Say) in Organic Farming

The Colorado potato beetle (CPB) is one of the most important pests on potatoes (*Solanum tuberosum*). In many areas, preventive measures do not appear to be sufficient in preventing the damage caused by the CPB. This is why insecticides such as neem and *Bacillus thuringiensis v. tenebrionis* (*B.t.t.*) have an important role in organic potato production in Germany (Kühne et. al. 2008). The new insecticide Spinosad was added to Annex IIB of the Council Regulations (EEC) No. 2092/91 on organic production in 2008. It is now possible to use Spinosad in organic agriculture in the EU that is obtained from the bacterium Saccharopolyspora spinosa through fermentation. Spinosad is used to control pests, mainly in greenhouses, orchards and storage facilities. Kowalska [2] and Igrc et al. [1] have carried out some investigations into the use of Spinosad to combat the CPB. It is toxic for insects by ingestion and through contact and has little effect on mites and sucking insects [4] except thrips. The influence of Spinosad on the CPB's various developmental stages were tested in the laboratory by way of a leaf dipping test (IRAC Susceptibility Test Methods Series No. 7, www.irac-online.org). Concentrations from 0.01 to 0.12 ml of Spinosad pro litre of water were used (the recommended dose is 0.06 ml/l water). The highest mortality was reached in the laboratory conditions for the younger larvae L1 and L2 (0.01 to 0.06 ml Spinosad/l water). After 48 hrs, 100 % of the treated population had died. The older larvae (L3 and L4) and the beetles were more resistant. After six days some of the insects were still alive, although they were paralysed (0.06 - 0.12 ml Spinosad/l water). Differences were identified between the mortality of the older larvae and the beetles among the various temperatures. After four days, 10 % and 85 % mortality was observed among the older larvae at 15 °C and 25 °C, respectively (0.12 ml Spinosad/l water). After two days, 37 % and 95 % mortality was observed among beetles at 15 °C and 25 °C, respectively (0.12 ml Spinosad/l water). The laboratory studies were supported by Organisation for Economic Co-operation and Development (OECD). Various field studies were carried out at a test site of the Federal Research Centre for Cultivated Plants (JKI) in Dahnsdorf (Federal State: Brandenburg, Germany) that is certified for organic farming according to the EU regulations (Control No.: D-BB-043-4143 A; soil type: sandy loess sL, mean annual precipitation: 526 mm). The trials were conducted as a randomised, single-factor experiment with block design and four replicates. Three treatments were compared in 2008 (plot size: 6 m x 34 m). 1: single Spinosad treatment (24 g/ha active ingredient (a.i.)) 2: first treatment B.t.t. (60 g/ha (a.i.)), second treatment (+4dd) B.t.t. (100 g/ha a.i.) 3: first treatment neem (25 g/ha a.i.), second treatment (+4dd) B.t.t. (100 g/ha a.i.). There was an average of 27 larvae per plant before the treatments. Since effected larvae may be counted as alive on the plants for a relatively long period of time following the application of neem, its efficacy was calculated according to the damaged leaf area with the Abbott-formula. All treatments displayed nearly the same significant degree of effectiveness (78 – 83 %) with regards to the damaged leave area 25 days after treatment in comparison to the untreated control.

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