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EFFECT OF PRECOCENE II – ANTIJUVENILE HORMONE ON THE DEVELOPMENT OF
COLORADO POTATO BEETLE LARVAE, *LEPTINOTARSA DECEMLINEATA* SAY
(COLEOPTERA: CHRYSOMELIDAE)

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The Colorado potato beetle (CPB), *Leptinotarsa decemlineata* Say (Coleoptera: Chrysomelidae), is the most serious insect pest of the cultivated potato and major pest worldwide. This pest has a complicated and diverse life history, which is well suited to agricultural environments. For control of the CPB, growers rely exclusively on chemicals. The increasing incidence of resistance to almost every insecticide used against it may lead to serious control problems. Precocene, antijuvenile hormone, exerts cytotoxic effects on corpora allata of sensitive insect species, which leads to the necrosis of parenchymal cells, the source of juvenile hormone. The action of precocenes was determined to be indirect and mediated by the brain. Therefore, all precocenes which are under control of juvenile hormone are disrupted. In this study the Antijuvenile hormones with biological activity have been tested against pest insects.

The effect of precocene II – antijuvenile hormone was tested on the different larval instars of the CPB after treatment of the host-plant or by topical application. Various concentrations (0.001, 0.005, 0.01, 0.05, 0.1, 0.5, and 1%) were prepared either in water for treatment potato foliage, or in acetone for topical application.

Based on the laboratory studies, with the 2nd larval instar eating of potato foliage, which was treated 1% precocene II, 100% mortality was observed. Also, percentage of larval mortality and adult emergence in the experiment with the 2nd larval instar eating of potato foliage, which was treated 0.1% precocene II, were 90% and 10%, respectively. Larval mortality was correlated with precocene II concentration. In the low concentration of precocene II (0.001%) larval mortality, pupal and adult emergence percentages were 80, 10 and 10%, respectively. In the control, the mortality of larvae was 37.5%. In experiments with 2nd and 3rd larval instars, which were treated 1% precocene II on topically method, mortality was 100% and in the control was 40%. But with 4th larval instars, percentage of larval mortality and adult emergence were 21.1% and 65.8%, respectively. Also, at application of other concentration of precocene II (0.5, 0.1, 0.05, 0.01, 0.005), with the 3rd larval instar, larval mortality were 100%, but at application of low concentration of precocene II (0.001%) larval mortality and adult emergence percentages were 80 and 20%, respectively.

These results showed that the most sensitive stage is 2nd instar larvae. Also, the treated larvae showed severe morphological abnormalities and delays in development. The treatment of larvae CPB, leads to an increase in larval mortality owing to its non-specific toxic effect and to a delay in initiation of molting processes resulting from the probable inhibited secretion of ecdysteroid molting hormones. Hence, more effective method of application precocene II on larval CPB was topically application.

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