

COTTON Innovate



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RESEARCH ROUND-UP

Neonicotinoids and bees

Neonicotinoids were first released for use in India on cotton against sucking pests in the year 1996, 5 years after its introduction in the US. Neonicotinoids are represented by the most popular formulation, Gaucho[®], a seed treatment chemical that is used for seed treatment of hybrid Bt cotton that occupies more than 95% of the cotton area in India. Apart from this, multiple foliar sprays of neonicotinoids are widely used on cotton to protect it from sucking pests.

Neonicotinoids are systemic and have a long half life. Both these features make them excellent candidates for pest management. Neonicotinoids are reported to exist as residues in pollen and nectar as well as in guttation fluids and in extrafloral nectaries.

They also persist for months or years after application and untreated plants have been reported to absorb residues from the previous year's application. Imidacloprid has a half life of 40-997 days in the soil.

Honey bees exposed to sublethal doses of neonicotinoids exhibit reduced food consumption and survival, worker mortality and poor foraging activity. A mite called *Varroa destructor* causes varroosis, which makes the bees vulnerable to RNA virus called DWV (deformed winged virus), because of which bees lose their flying capabilities thus resulting in colony collapses. Exposure of bees to neonicotinoids may weaken bees and make them more vulnerable to *Varroa* or *Nosema*. The contact median lethal dose (LD₅₀) is reported between 0.018-0.243µg/bee while the oral median lethal dose (LD₅₀) is between 0.0037µg/bee- 0.081µg/bee. In cotton, bee aided pollination is less than 5%, cotton pollen being sticky and heavy. However excessive use of neonicotinoids on cotton as a foliar spray is detrimental to pollinators, including bees, visiting cotton plants for nutrition when it is in full bloom. This would impact yield of other crops relying on insect pollinators for cross pollination to occur. Honey production would be affected severely in India if the European bee *Apis mellifera* is affected by neonicotinoids and/or *Varroa*.



Source: Bee world project

S.Kranthi and K.R.Kranthi

MEETINGS ATTENDED

Dr K. R. Kranthi, Director, CICR attended Central Insecticide Board Meeting at Mantralaya, Mumbai on 12th June, 2014.

Dr K. R. Kranthi, Director, CICR attended HDPS Meeting scheduled on 13th June, 2014 at Main Cotton Research Station, Navsari Agricultural University, Athwa Farm, Surat.

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