Pest management in cotton : Strategy and tools of IPM

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Cotton (*Gossypium* spp.) is grown commercially under diverse agroclimatic conditions prevalent in Indian states.At present, India ranks first in the world in area and fourth in production with lower productivity (280 kg/ha). One of the major reasons for the low productivity is the damage caused by the attack of insect pests which results in up to 50 per cent losses in the yield. Among 162 species of insects associated with cotton, only eight species are considered as major pests (Table 1). During earlier days, these pests were controlled with traditional practices. With the introduction of Green revolution (GR) in early seventies, insecticides have been used extensively. The misuse/overuse of these braod-spectrum insecticides or the sublethal doses have resulted in several undesirable side effects such as, development of resistance in insect populations, pest resurgence, destruction of natural enemies, changes in dynamics of pest populations, contamination of environment and fibre. In view of the limitations of the conventional control methods, pest management strategy had been evolved and is being implemented on large scale in cotton growing regions. Likewise, the international organizations such as, FAO, World Bank, UNDP and UNEP co-sponsored the establishment of the global IPM facility.

Strategy :

The integrated control was first defined in 1959 as "applied control which combines and integrates biological and chemical control". With the advancement in knowledge, this definition was modified, at least by 65 definitions. However, FAO Panel of Experts defined it as " a pest manangemet system that, in the context of associated environment and population dynamics of the pest species, utilizes all suitable techniques and methods in as compatible a manner as possible and maintains pest populations at levels below those causing economic injury". Studies on IPM with several concepts were collated and finally, an inherent definition had been proposed by Kogan (1998), e.g., "a decision support for the selection and use of pest control tactics, singly or harmoniously coordinated into a management strategy, based on cost/benefit analysis that take into account the interests of and impacts on producers, society and the environment". This strategy is predicted or based on a series of control and management practices. Such a system does not rely on the strength of one means of control. Thus, IPM is a blend of the traditional and modern methods of insect suppression, directed to allow certain populations of insects to remain in the agroecosystem to

Table 1 : Common major insect pests of cotton

Pest (common name)	Species (scientific name)	Pest status during season		
		Early	Mid	Late
Aphid	*Aphis gossypii* Glov.	3	3	0
Thrip	*Thrips tabaci* (Genn.)	3	2	0
Jassid	*Amrasca biguttala biguttala* (Shir.)	3	2	0
Whitefly	*Bemisia tabaci* (Genn.)	0	3	2
Leaf roller	*Sylepta derogata* (F.)	2	1	0
Armyworm	*Spodoptera litura* (F.)	1	2	2
Spotted bollworm	*Earias* spp.	1	3	2
American bollworm	*Helicoverpa armigera* (Hb.)	1	3	2
Pink bollworm	*Pectionophora gossypiella* Saund	0	1	3
Red cotton bug	*Dysdercus koenigii* (F.)	0	2	3
Dusky cotton bug	*Oxycarenus laetus* K.	0	0	2
Semilooper	*Anomis flava* Fb.	1	2	0
Stem weevil	*Pempherulus affinis* Faust.	0	1	1

Status: 0= no attack/status not known, 1= secondary or less importany pest, 2= occasional or moderately important pest, 3= major or economically important pest.
Early season = vegetative growth period (0-45 days after germination), Mid season = squares, flowers and bolls start appearing (45-90 days after germination), Late season = boll maturity (90 days until harvest)

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