Honeybee Pests & Diseases – Integrated Pest Management

Integrated pest management (IPM) is a well tried, tested and recommended practice throughout agriculture and uses a variety of controls applied throughout the season. The UN's Food and Agriculture Organization defines it as *"the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimize risks to human health and the environment"*. IPM allows for safer Varroa destructor control in beekeeping with less risk to bees, bee products, and the beekeeper.

The benefits are:

- Control at several points makes it harder for the mites to reach harmful levels.
- Including a bio-technical method can slow mite reproduction and reduce the need for varroacides.
- Using 2 or more unrelated varroacides will delay the development of resistance.
- The control strategy can readily be adjusted to reflect changing infestation levels

Chemical Control

Currently there is a good range of chemical treatments available and approved by the Veterinary Medicines Directorate (VMD) for treating Varroa:

Treatment	Active Ingredient	For Controlling
Apiguard Gel	*Thymol*	*Varroa*
Apilife-Var Strips	*Thymol, and essential oils (Camphor, Eucalyptus and Menthol)*	*Varroa*
Apistan Strips *	*Tau F*	*Varroa*
Api-Bioxal	*Powder or solution Oxalic Acid dihydrate*	*Varroa*
Apitraz Strips	*Amitraz*	*Varroa*
Bayvarol Strips*	*Flumethrin*	*Varroa*
Dany's BienenWohl Powder and Solution	*Oxalic Acid dihydrate*	*Varroa*
Mite Away Quick Strips (MAQS)	*Formic Acid*	*Varroa*
Oxuvar Powder and Solution	*Oxalic Acid dihydrate*	*Varroa*
PolyVar Yellow Strips	*Flumethrin*	*Varroa*
Thymovar Strips	*Thymol*	*Varroa*
VarroMed Solution	*Formic acid, Oxalic Acid dihydrate*	*Varroa*

* Resistance to these products has been confirmed in the UK

Only use products that are approved by the Veterinary Medicines Directorate (VMD)

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Bio-technical Controls

Equipment for bio-technical control: Open Mesh Floors; Bee Gym; Frame Trap.

Comb Trapping – this involves putting a shallow frame into the brood box to encourage the building of sacrificial drone comb down from the underside, Varroa prefer to lay eggs in these cells. When the drone cells are sealed the comb is cut off and destroyed. It can be effective in keeping Varroa numbers down in colonies with lower counts but has no effect on heavy infestations. However drones are important for the colony and removing too many would be detrimental. Using a range of bio-technical / chemical treatments across the season is the best option for effective control and avoiding build up of resistance.

IPM - Varroa

The table below sets out an example of an IPM plan for controlling Varroa destructor. Treatments are applied in the green shaded months:

Treatment	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mesh Floor												
Brood Trapping												
Artificial Swarming												
Comb Trapping												
Apiguard / Formic Acid												
Bavarol / Apistan												
Lactic / Oxalic Acid												

This is an example, you can formulate your own IPM plan using the chemical and bio-technical controls available to you. In addition, prevention is best practice, maintain good apiary housekeeping and bee husbandry:

- Always maintain strong and vigorous colonies that show good hygienic tendencies, re-queen from known healthy colonies.
- Always maintain a high level of hygiene in all your beekeeping practices.
- Carry out methodical health inspections on a regular basis, checking for brood disease particularly in spring and autumn.
- Never transfer combs between colonies without checking for brood diseases
- Systematically replace old brood combs in your hives melting down the old comb to maintain clean and healthy brood.
- Never bring colonies or equipment into your apiary without establishing their origin, condition, and disease status.
- Sterilise any second hand equipment or hive components before introducing them into your apiary
- Discourage drifting and robbing in the apiary.
- Suspect stray swarm health until you know otherwise.
- Report any incidence of disease or suspicious conditions immediately to your local association.