

Syllabus of Examination for Proficiency in Apiculture: Intermediate Examination Scientific Paper

Although the following is a comprehensive outline of the syllabus, the student is also expected to be up to date with modern ideas on the honeybee, particularly where these ideas are dealt with in newer textbooks or in lectures that (s)he has attended.

Natural History of the Honeybee

The student will be able to:

- describe the stages in the life cycle of the three castes and the average number of days for each stage of metamorphosis
- describe the function of each caste in the life of the colony
- give an elementary description of parthenogenesis in the honeybee
- give a simple description of sexual reproduction in the honeybee, the aerial mating of the queen and the drone, and the multiple mating of the queen
- give a simple description of the communication dances of the honeybee workers
- give a simple description of queen substance and its influence on the production of queen cells
- give a simple description of food sharing in the colony,

External Anatomy and Internal Biology

The student will be able to give:

- an elementary description of the structure and segmentation of the exoskeleton
- a detailed description of the external structure of the queen, worker and drone honeybee
- an elementary description of structure and an elementary appreciation of the function of the appendages of the honeybee worker (the mouthparts, the antennae, the legs, the wings and the sting)
- an elementary description of the general structure and function in the adult worker bee of the alimentary canal and the digestion of sugars and pollen
- the excretory system, including the function of the malpighian tubules
- the respiratory system and the interchange of oxygen and carbon dioxide
- the exocrine glands of all three castes, but only the hypopharyngeal, mandibular glands, salivary glands, wax glands and Nasonov glands
- the circulatory system, including the heart, dorsal and ventral diaphragms.

Note Simple labelled diagrams of all of the above are required.

Nectar and Honey

The student will be able to give:

- an elementary account of the composition of nectar and its variations
- an elementary account of the conversion of nectar to honey, including chemical changes of the basic sugars and the storage of honey by the bee, chemical equations are not necessary
- the approximate percentages of the major constituents of a honey of average composition
- an elementary description of the process of granulation of honey
- an elementary description of the process of fermentation in honey
- an elementary account of the importance of pollen in the nutrition of the honeybee

Honeybee Forage, Plants and Pollination

The student will be able to give:

- an elementary account of the process of pollination of a flowering plant using labelled diagrams
- an elementary account of the process of fertilisation of a flowering plant using labelled diagrams

Diseases, Pests and Pathogens

The student will be able to give:

- an account of the signs of Varroosis, how it spreads, methods of detection, monitoring and treatment
- an account of the signs of Small Hive Beetle infestation, how it spreads, methods of detection, monitoring and treatment
- an account of the diagnosis of American Foul Brood (AFB) and European Foul Brood (EFB) and a tabulation of the differences between the signs of these two diseases
- an account of the ways in which foul brood infections can spread from colony to colony
- an account of the action necessary to take when AFB or EFB is found, including treatments and sterilisation of equipment
- an account of the major provisions of the statutory regulations relating to Foul Brood, and their implementation in Ireland
- an account of the signs and treatment of chalkbrood disease
- an account of the signs of, and the recommended treatment for adult bee diseases Nosema and Acarine
- an account of colony starvation and possible remedial actions
- describe the Bailey frame change
- describe the Shook swarm
- an account of the expert services available to the beekeeper

Note recommended answers on diseases should include causative agents, signs, symptoms, effect on colony, spread and treatment/prevention.

Honeybee Products and Their Preparation for Show and for Sale

The student will be able to:

- give the approximate composition of an average honey
- give an account of the properties of honey including specific gravity, viscosity, hygroscopicity and reactions to heat
- give a description of the main constituents and physical properties of beeswax
- give an account of the uses for, and marketing of, beeswax
- give an account of the use of other bee products such as pollen, royal jelly, venom and propolis
- give an account of the preparation of bee products for the show bench

Note this syllabus is indicative not exhaustive (look on both scientific and practical for completeness)