



PLANTS & POLLINATORS MODULE

SYLLABUS & READING LIST

Applicable from December 2023

Aims

The Plants & Pollinators Module is designed to enhance beekeepers' knowledge of the interactions between plants and pollinating insects. It is separate from the normal Module cohort of exams and is not included as a requirement for obtaining the Module Intermediate or Advanced certificate nor for progressing towards the SBA Expert qualification.

Conditions of Entry

Candidates must be members of the Scottish Beekeepers Association (SBA).

This module can be taken at any time in the SBA Education system. It shall be offered in the same exam diets as the normal modules.

The Education Administrator shall have received confirmation of application and fee payment by the published date for module applications.

Applicants should apply online at the SBA website. Links to the application document are given in the Exams section of the website. Alternatively, candidates wishing to sit written exams (at an exam centre) can also apply by post using the application form on the website and marking it Plants and Pollinators.

Award of Certificate

An SBA Certificate will be awarded for passing the module and the pass mark will be 60% for a Pass, Credit 70%, Distinction 80%

The Examination

The Plants and Pollinators module consists of a written or online (typed) paper. Candidates will be expected to use scientific nomenclature where applicable.

The Examiners may include, in any module examination, any topic from the SBA Basic Beekeeping syllabus.

The Candidate shall be able to give an account of:

- 1.1 the major plant groups including nonvascular plants, seedless vascular plants, gymnosperms, and angiosperms
- 1.2 the different types of cotyledons in terms of features, structure, and identification features
- 1.3 how a plant grows and develops
- 1.4 the environmental factors affecting the growth of a plant
- 1.5 the major nutrients that nourish plants
- 1.6 the differences in flower structure between families, e.g. location of receptacle and nectary, specifically for; wood anemone, meadow buttercup, corn poppy, meadow cranesbill, bramble, petty spurge

- 1.7 the pollination strategies employed by plants in relation to the environment, insects/animals and targeting specific pollinators
- 1.8 nectar secretion in terms of location, typical nectary structure and environmental factors that can affect the composition and quantity of nectar secreted
- 1.9 the process of fertilisation of an apple ovum
- 1.10 the structure of a typical seed and the process of its germination
- 1.11 the key identifying features of flies, butterflies/moths, beetles, and bees
- 1.12 complete and incomplete metamorphosis
- 1.13 the major UK orders of insect pollinators
- 1.14 the typical life cycle of each pollinating insect order
- 1.15 the structural features of an insect from each order that relate to successful pollination of a plant, including mouthparts, vision, transportation, and feet
- 1.16 the pollination activities including transportation of pollen and typical plants visited by solitary bees, bumblebees, and honey bees
- 1.17 the life cycles of the white tail, buff tail and tree bumblebee, include the seasonality and other differences that may affect their success
- 1.18 the life cycle of the turnip sawfly, ivy solitary bee, soldier beetle, thick leg flower beetle, yellow brimstone butterfly, green veined butterfly, marmalade hoverfly, thick headed hoverfly
- 1.19 the commercial use of bumblebees for pollination purposes, highlighting the advantages of using bumblebees, the environmental risks and legal requirements relating to their use in the UK
- 1.20 positive and negative changes to pollinator populations over the last 50 years, outlining possible causes of these changes and why different pollinators have been more affected than others
- 1.21 the habitats that encourage pollinators to thrive in rural and urban environments
- 1.22 the recording schemes within the UK for pollinators; how they operate and are coordinated for Diptera, Lepidoptera and Hymenoptera

The Candidate shall show knowledge and understanding of:

- 1.23 the key considerations when planning a planting scheme to encourage pollinators
- 1.24 the benefits and possible disadvantages of different types of planting, including hedge rows, trees/shrubs, garden plants and wild flower meadows
- 1.25 example landscapes and plants that attract and support the orange tip butterfly, hummingbird hawk moth, ashy mining bee, white tail bumblebee, bee fly, cabbage beetle
- 1.26 how the following plants are beneficial to pollinators: Dandelion, Bramble, Wild Marjoram, Honesty, Field Maple and Field Bean
- 1.27 methods of identifying plants in flower, during the winter and from samples of honey
- 1.28 key identifiers of the flowering plants in the following families: Asteraceae, Rosaceae, Lamiaceae, Brassicaceae, Sapindaceae and Fabaceae
- 1.29 the work of major environmental schemes and organisations within the UK encouraging plants and pollinators including Wildlife Trusts, Butterfly and Bumblebee conservation, national pollinator strategies for bees and other pollinators
- 1.30 the national recording schemes that are in place for plants
- 1.31 the ragwort plant with respect to Government legislation, the risks to humans and animals and the pollinators that rely upon it

Plants & Pollinators Reading List: (Courtesy of the BBKA)

- The pollination of flowers, Procter and Yeo
- Plants for bees, Kirk and Howes
- Plants and beekeeping, Howes
- Introductory botany, plants, people and the environment, Berg
- A bouquet of wild flowers, Hutchinson
- Gardening for bumblebees, Goulson
- Collins Wild Flower Guide
- A comprehensive guide to Insects of Great Britain and Ireland, Brock
- Field guide to the bees of Great Britain and Ireland, Falk
- Life cycles of British and Irish Butterflies, Eeles
- The wild flower key, Rose
- Floral Biology, Percival
- Insect Pollination of Crops, J.B. Free
- The Honey Bee Around and About, Celia F. Davis

Online resources:

UK Pollinator Monitoring Scheme <https://ukpoms.org.uk/>

UK Butterfly Monitoring Scheme <https://ukbms.org/>

Woodland Trust <https://www.woodlandtrust.org.uk/media/1800/wood-wise-hedgerows-andhedgerow-trees.pdf>

Bees, Wasps & Ants Recording Society <https://www.bwars.com/>

Soldier Beetle <https://www.learnaboutnature.com/insects/beetles/soldier-beetle/>

Bumble Commercial Production <https://www.koppert.com/>

Bumblebee Conservation <https://www.bumblebeeconservation.org/>

Defra services <https://www.gov.uk/government/organisations/department-for-environment-food-rural-affairs/services-information>

Defra ELM <https://www.gov.uk/government/publications/environmental-land-management-schemesoverview>

Ragwort <https://www.gov.uk/guidance/stop-ragwort-and-other-harmful-weeds-from-spreading>