

information

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Plant science



Plant scientists study plants, fungi and algae – their structure, how they grow and reproduce, their distribution and the diseases and pests that can affect them. The work of plant scientists is used in conservation, medicine and agriculture. Most scientists have relevant degrees.



Science, maths and statistics/
Scientific research and
laboratory science

This leaflet is written mainly for people intending to take biology at A level (or equivalent) with a view to continuing this area of study at a higher level. If you are interested in plants, but do not feel that degree-level study is for you, look at the leaflets that describe careers in horticulture listed at the end.

Plant science covers lots of different disciplines, including, plant ecology (how plants interact with each other and their environment), plant physiology (the structure of plants) and taxonomy (naming and classifying plants). You need to take a relevant degree to be employed in plant science for a research organisation – perhaps, with a conservation concern, or for a commercial organisation, such as a seed-grower or fertiliser manufacturer.

What it takes

Plant scientists need to be:

- careful, observant and methodical workers
- good with numbers
- able to use scientific techniques and sophisticated equipment
- good at problem solving
- interested in plants and science!

What does a plant scientist do?

The work done by plant scientists is very varied and may be for commercial concerns, research institutes or plant conservation organisations.

Many scientists who are involved in plant surveys and classification, refer to themselves as field botanists. Some botanists concentrate on studying populations of an individual species in particular habitats – such as meadows, chalk uplands, moorland heath, deciduous woodlands, duneland or wetlands. Population studies, repeated regularly at a number of sites throughout the British Isles, give useful information about the effects of pollution, forest fires, drought, overgrazing etc on our native flora. Botanists with specialist knowledge can perform such studies in different regions of the world. Botanists may work with other researchers and scientists as one fieldwork trip can generate a great deal of follow-up lab work!

Some plant scientists specialise in the structure and functioning of plants. They may work in a plant-breeding station, where the size of leaf, standard height of a stem or colour of petals, for example, can all be changed through breeding new hybrids that are more successful commercially. Rose breeding is one example. Many specialist plant and seed retailers breed new varieties of plants for both professional gardeners and keen amateurs.

Many plant scientists work entirely in the area of plant reproduction and genetics. This is particularly important in the development of commercially

grown crops. Farmers need to grow crops that meet their needs; many scientists are involved in developing new species that produce bigger yields, are resistant to disease, pests and poor weather and have a shorter crop cycle. New varieties of crops such as sugar beet, potatoes, pulses and cereals have all been developed. This is time-consuming work; it can take years to perfect a new variety. Trials on the effects of genetically modified food crops also have to be carefully monitored over a long period of time.

Another area of research, in which plant scientists may work, is the medicinal use of plants.

Choosing a degree

On a plant science degree course, you usually study:

- plant classification, evolution and biodiversity
- plant cell structure and function
- plant biochemistry
- plant physiology – how plant tissues function; the effects of temperature, light, moisture, plant hormones etc
- plant genetics, breeding and pathology
- ecosystems, understanding how plants interrelate with each other and their environment.

You can study plant science as a single degree subject or as part of a biology degree. For entry to a degree course, you need a minimum of two, and often three, A levels, plus supporting GCSEs (including English and maths). Biology at A level is normally required; many institutions require another science at A level – chemistry may be preferred or specified. Qualifications equivalent to A levels, such as a BTEC Level 3 National in applied science, may be acceptable, but some institutions look for additional qualifications alongside. **Check entry requirements carefully with individual institutions.**

For those interested in plant science research, the John Innes Centre and Sainsbury Laboratory in Norwich runs an **Undergraduate Summer Student Placement** scheme. Students on the scheme undertake eight weeks of research training. The scheme is fully funded and accommodation is provided. Undergraduates of any discipline can apply. For more information, see: www.jic.ac.uk/summerprogramme

Many graduates go on to take a postgraduate course in a specialist subject to improve their prospects.

Employment

Relatively small numbers of plant science graduates enter the job market each year. Look in specialist journals such as *Nature* or *New Scientist* (or on their websites) for job vacancies. A period of relevant voluntary work can help when applying for jobs. Plant science graduates can use their skills in unrelated fields of employment.

Degrees or postgraduate qualifications in applied subjects (e.g. crop science) can help when it comes to finding work. The main opportunities are in government-funded research institutes and in agricultural and horticultural firms' research and development departments. If your aim is research work, you will normally need a higher degree. Research posts in higher education are a possibility, but rarely offer permanent work. There may be opportunities to work abroad, especially with commercial growers.

Adults: For those with considerable knowledge and experience of plants, perhaps in a particular habitat, there may be jobs for which normal entry requirements are relaxed. A science Access course can provide an entry route into higher education.



For further information

See higher education handbooks and databases for information on courses.

Society of Biology – tel: 020 7936 5900.
www.societyofbiology.org

Botanical Society of the British Isles – information on training can be found on: www.bsbi.org.uk

British Society of Plant Breeders Ltd – tel: 01353 653200. To download the booklet *Plant Breeding – the business and science of crop improvement*, go to: www.bspb.co.uk/plantbreeding.html

Working in the Environment – published by Babcock Lifeskills, £8.50.



Other leaflets in this series that may interest you

- HB 01 Nature conservation
- HB 02 Forestry, arboriculture and tree surgery
- HB 03 Horticulture
- HB 06 Graduate-level careers in horticulture
- TD 02 Careers using biological sciences
- TD 11 Working for the environment
- TD 13 Genetics
- TD 19 Zoology and animal science

Seek advice if you meet discrimination due to age, disability, race, religion, sex or sexual orientation.

This leaflet will next be revised in August 2011.

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