

information

TD 10 August 2007

Botany/plant science



Botanists and plant scientists study plants, fungi and algae – their structure, how they grow and reproduce, their distribution and the diseases and pests which can affect them. The work of botanists/plant scientists is used in conservation, medicine and agriculture. This career is mostly followed by graduates of botany or related subjects.



Science, maths and statistics/
Scientific research and
laboratory science

This leaflet is written mainly for people intending to take biology at A level (or an equivalent qualification) with a view to continuing this area of study at a higher level. If you are interested in plants, but do not feel that study to degree level is for you, look at the leaflets that describe careers in horticulture. Just as much job satisfaction can be gained as in the more academic study of botany.

It is possible to be an amateur botanist, and maintain a strong interest in the subject through belonging to organisations, while following a quite separate career path. However, you need to take a relevant degree to be employed full-time in botanical studies for a research organisation - perhaps, with a conservation concern, or for a commercial organisation such as a seed-grower, fertiliser manufacturer etc.

What it takes

Plant scientists need to be:

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

What does a botanist do?

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

Some botanists concentrate on **studying populations of an individual species** in particular habitats – such as meadow, chalk upland, moorland heath, deciduous wood, 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/plant scientists with specialist knowledge can perform these studies in different regions of the world. Many of the tasks of a botanist are conducted in a laboratory; 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 size of seed, colour of petals, for example, can be changed through breeding new hybrids which are more successful commercially. Rose breeding is one example, or studies on crops such as tea or rice.

Botanists may work entirely in the area of plant **reproduction and genetics**. This is particularly important in the development of commercially-grown crops. The control of pests living on these plants is also an important aspect of botanical research. Trials on the long-term effects of genetically-modified food crops have to be carefully monitored over a long period of time.

There is considerable investigative work performed on **plant nutrition, plant hormones and plant biochemistry** in general. Here, botanists make use of the most advanced methods of experimentation and analysis, employing sophisticated instruments such as scanning electron microscopes, radioisotope counters, atomic absorption spectrophotometers etc.

Choosing a degree

On a botany or plant science degree course, you usually study:

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

You can study plant science or botany as a single-subject degree or as part of a biology degree. To study for a degree, you will need a minimum of two A levels or an equivalent qualification, plus supporting GCSEs. Three A levels are required for entry to most botany/plant science degree courses. Biology at A level is essential, but you will have the widest choice of degree courses by taking both biology and chemistry at A level. Opportunities vary for applicants with BTEC National qualifications in science; some institutions look for additional qualifications. **Check carefully with individual institutions.** Almost all courses require GCSE maths, as the majority of botanists need to make statistical analyses.

Many graduates go on to take higher degrees in a specialist field to improve their prospects.

Adults: For those with considerable knowledge and experience of plants, perhaps in a particular habitat, there may be paid opportunities for which normal entry

requirements are relaxed. If you want to study botany to degree level, speak to course tutors about entry with your particular qualifications and experience.

Employment

Relatively small numbers of botany graduates enter the job market each year. Look in specialist journals and *Nature* or *New Scientist* for job vacancies.

If your aim is research work, a higher degree is virtually essential. Degrees or postgraduate qualifications in some applied aspect of botany (e.g. agricultural botany or plant pathology) can help when it comes to finding a job. Main opportunities are in government-funded research institutes and in agricultural and horticultural firms' research and development departments. Research posts in higher education are a possibility, but rarely offer permanent work. There may be opportunities to work abroad, especially with commercial growers.



For further information

See higher education handbooks and databases for information on courses.

Institute of Biology – 9 Red Lion Court, London EC4A 3EF. Tel: 020 7936 5900. www.iob.org

Botanical Society of the British Isles – c/o Department of Botany, Natural History Museum, Cromwell Road, London SW7 5BD. Write to the Honorary General Secretary for more information on the work of the Society, their literature and career notes. www.bsbi.org.uk

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

Biological Sciences – one of the CRAC Degree Course Guides – published by Trotman, £9.99.



Other leaflets in this series which 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/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 2008.

© Nord Anglia Lifetime Development SW Ltd, 2007.