PLANT IDENTIFICATION AND CULTURE

Lesson Aim

Differentiate between different plants on the basis of appearance and cultural needs; and through this, develop a foundation for determining both how to identify and how to treat different types of plants.

UNDERSTANDING PLANT CLASSIFICATION

It is important to understand before anything else the way plants are classified, i.e. how they get their names.

Horticulture deals with living things and as such is somewhat unpredictable and variable. The ways you treat a plant is different from place to place, time to time, and according to what you are trying to get from the plant.

When referring to a book or magazine article, always look at where it was written and by whom it was written. Most gardening writers usually write about gardening in their own locality. If you live in a different city those recommendations might be quite misleading for you! There can be great variations over relatively small distances in such things as rainfall, wind and soil type. A certain type of tree may very well grow twice as tall in the eastern suburbs of a large city compared to its eventual height in the western suburbs of the same city.

In horticulture, often there are different ways of tackling a job; each one just as valid as the next. Never consider that a particular technique is the only way of doing something! You should try to be aware of the advantages and disadvantages of all of the alternatives. They all have their pros and cons, and it is up to your own preferences as to which way you choose to do something.

This subject guide has been written to teach horticulture in a way that will be relevant to all parts of the world. It puts aside regional techniques, and tries to teach you principles and concepts that can be applied to anywhere. Keep this in mind as you study. Try to see the principles. You are not just studying facts.

PLANT NAMES

Plants are given two different types of names:

- **Common Names:** These are English language names usually given to plants by amateur gardeners as a descriptive, easy-to-remember tag. Many plants have more than one common name, and sometimes the same common name can be given to several quite different plants. This, along with the fact that there is no real control over common names, makes them inaccurate and unreliable for plant identification.
- **Scientific Names:** These are based on the Latin language. These names often seem more complex than common names at first glance; however they have a system to them which can make plant identification much easier. The system of scientific naming is strictly controlled and coordinated by botanists throughout the world. Scientific names should always be used in preference to common names.

In the scientific system, plants are classified by dividing them into groups with similar characteristics. These groups are then divided into smaller groups with similar characteristics. These are divided again and so the division of group to sub-group and sub-group to further sub-groups goes on, until you finally have only one type of plant in each group.

There are many different levels of division, although the main ones we use are just a couple at the bottom end of the scale.

The plant names you see in books or on plant labels in a nursery will usually consist of two words:

- The first word is the **genus** name of the plant.
- The second word is the **species** name of the plant.

Levels of Division

The main levels of division are as follows:

- All plants are divided into PHYLA.
- Phyla are divided into CLASSES.
- Classes are divided into ORDERS.
- Orders are divided into FAMILIES.
- Families are divided into GENERA (singular: Genus).
- Genera are divided into SPECIES.
- Species are sometimes divided into VARIETIES.

The main plant phyla we are concerned with in horticulture are:

- ANTHOPHYTA (e.g. Angiosperms). This group includes all of the plants which produce flowers (e.g. eucalypts, roses, lettuce and grasses).
- CONIFEROPHYTA (e.g. Conifers). This includes all plants that produce cones (e.g. pines, cypress).
- PTEROPHYTA (e.g. Ferns)
- Other phyla include mosses, fungi, bacteria and algae.

Anthophyta is divided into two classes:

- DICOTYLEDONAE. In these plants, the first leaves to appear from a germinating seed are in a pair (two leaves appear at the same time). The veins in the leaves are not parallel in these plants. Examples of dicots are peas and Eucalypts.
- MONOCOTYLEDONAE. In these plants, the first leaf to appear when a seed germinates is a single leaf. Veins in the leaves are parallel to each other. Examples of monocots are grasses, Iris and orchids.

It can be seen above that you can distinguish between dicotyledons and monocotyledons by a couple of very simple characteristics. In the same way, we can usually distinguish which *family* a plant belongs to by a few basic characteristics. For example:

- Lamiaceae family: foliage is perfumed and flowers have two distinct lips, e.g. mint and lavender.
- Araceae family: leaves are usually heart-shaped and the plants originate in tropical areas, e.g. Philodendron.
- Asteraceae familiy: have daisy-type flowers, e.g. Chrysanthemum.
- Apiaceae family: flowers occur in an umbrella-like head on a single stalk, e.g. parsley.

You should be able to tell a family name from other types of names by the fact that it will end with "ACEAE". Students have sometimes called the family name a genus. Note that a genus name virtually never ends in the letters "aceae".

For example: Betula pendula

- *Betula* is the genus
- *pendula* is the species

The genus name begins with a capital letter. The species name is usually written beginning with a small letter.

Sometimes a third word (and perhaps a fourth) is added to follow the species. These words would refer to the variety of that particular species.

For example: *Acer palmatum dissectum atropurpurea*:

- *Acer* is the genus
- *palmatum* is the species
- dissectum tells us that this is a variety of *Acer palmatum* with dissected leaves
- purpureum tells us that this variety of *Acer palmatum* has purple foliage

You may occasionally be confused by the difference between hybrid and variety:

- A hybrid plant is one which has resulted from two different species cross breeding. The hybrid is a combination of characteristics from two different species ... something bred or selected out of nature by man.
- A variety is just a particular type of plant in one species. A variety does not have parents from two different species, but a hybrid does, for example, the hybrid lavender *Lavandula* x *intermedia* is a cross between *Lavandula angustifolia* and *Lavandula spica*. The 'x' indicates that the plant is a hybrid (a 'cross' of two species).

TERMINOLOGY

Species

Organisms capable of freely interbreeding with each other, and/or with distinctly different morphological characteristics from other species in the same genus.

Genus

(Plural: Genera) A group comprising several species which have several common characteristics, but only interbreed occasionally.

Variety

A type of plant within a species which can be distinguished from other types in the same species by some obvious physical characteristics (e.g. leaf shape or colour, flower colour).

PRONUNCIATION OF PLANT NAMES

Plant names are based on the ancient Latin language, and as such, they should (strictly speaking) be pronounced using the rules of Latin. In practice however, plant names are pronounced differently from place to place, even within the same country. One expert horticulturist may pronounce a plant name one way, while another may use a completely different pronunciation. Both may be equally respected in the profession.

THE IMPORTANT THING IS THAT THEY BOTH SPELL THE NAME EXACTLY THE SAME WAY, IF THEY DO, THEN THEY CAN COMMUNICATE, EVEN IF THEY DO SOUND A LITTLE DIFFERENT.

The usual way to learn pronunciation is to learn to identify and spell plant names first, then as time goes by, and as you mix with other horticulturists, you will pick up the way they pronounce names which you have learnt. If you want to learn 100 percent accurate pronunciation of plant names, you can use a Latin language text book, or a book such as "Botanical Latin" (published by David and Charles, U.K.).

You are usually better advised to not worry about pronunciation too much when you first start studying horticulture. Concentrate on learning to identify and spell the names for at least 12 months before you start giving any significant attention to pronunciation. When you have got to the point of having a reasonable grasp of plant identification (i.e. when you can identify and spell at least 200 or so plants), you should then, start to pay a little more attention to pronunciation. The best way to polish your pronunciation at that point would be to mix with people who are fluent in their identification and pronunciation of plant names. Ideally, get a part time job in a nursery. If this is not possible, join a garden club.

BOTANICAL FAMILIES OF GENERA

Use the following lists as a guide to labelling your plant collection specimens with plant family names.

Dicotyledons	
Araceae	Alocasia, Arum, Calla, Anthurium, Philodendron, Caladium, Dieffenbachia, Monstera.
Asteraceae (Compositae)	Brachyscome, Helichrysum, Olearia, Dahlia, Chrysanthemum, Aster, Zinnia, Ageratum, Sunflower, Dandelion.
Brassicaceae (Cruciferae)	Cabbage, Cauliflower, Broccoli, Brussels Sprouts, Kale, Turnip, Wild Turnip, Mustard.
Epacridaceae	Astroloma, Epacris, Leucopogon.
Goodeniaceae	Dampiera, Goodenia, Leschenaultia, Scaevola.
Lamiaceae (Labiatae)	Mint, Thyme, Sage, Lavender, Prostanthera, Coleus, Hemiandra, Westringia, Salvia.
Legumes (Mimosaceae/ Caesalpiniaceae and Fabaceae)	Acacia, Bauhinia, Cassia, Cercis, Chorizema, Clianthus, Erythrina, Genista, Hovea, Hardenbergia, Lotus,
	Pultenea, Sophora, Swainsonia, Brachysema, Goodia, Kennedya, Wisteria, Indigofera, Pea, Bean, Clover, Lupin, Peanut, Mimosa. NB: Strictly speaking legumes have now been split into three families. At this stage in your study you may, for simplicity, classify all pod-bearing plants as legumes.
Malvaceae	Hibiscus, Abutilon, Gossypium (Cotton).
Myrtaceae	Astartea, Agonis, Beaufortia, Callistemon, Calytrix, Calothamnus, Eucalyptus, Eugenia, Kunzea, Leptospermum, Melaleuca, Tristania, Thryptomene, Micromyrtus, Chamaelaucium, Hypocalymma, Angophora, Feijoa, Myrtus.
Pittosporaceae	Billardiera, Pittosporum, Hymenosporum.
Primulaceae	Primula, Polyanthus.
Proteaceae	Banksia, Conospermum, Dryandra, Grevillea, Hakea, Isopogon, Macadamia, Stenocarpus,Telopea, Protea.
Ranunculaceae	Delphinium, Aquilegia, Ranunculus, Paeonia, Anemone, Clematis.
Rutaceae	Boronia, Correa, Crowea, Eriostemon, Citrus, Diosma.
Rosaceae	Cydonia, Pyracantha, Geum, Spiraea, Rosa, Apple (Malus), Prunus, Strawberry (Fragaria), Berry Fruit (Rubus).
Solanaceae	Petunia, Browallia, Cestrum, Solanum, Henbane, Tomato, Potato, Capsicum, Egg Plant, Tobacco.
Verbenaceae	Verbena, Lantana, Clerodendrum.

Apiaceae (Umbelliferae)	Actinotus, Carrot, Parsnip, Parsley.

Monocotyledons	
Amaryllidaceae	Anigozanthus, Hippeastrum, Nerine, Daffodil.
Poaceae (Graminae)	The grasses, corn, cereals, bamboos.
Iridaceae	Freesia, Iris, Sparaxis, Watsonia.
Liliaceae	Asparagus, Xanthorrhoea, Chlorophytum, Agapanthus, Onion, Lily of the Valley, Crocus, Hemerocallis, Hyacinth, Dracaena, Kniphofia, Lachenalia, Lilium, Liriope.

GROWING PLANTS IN A GREENHOUSE

A greenhouse is only as good as its user! You can grow all sorts of plants in a greenhouse, and achieve all types of things, which you might not be able to achieve otherwise, whether growing as a hobby or commercially.

However the greenhouse is only a tool which enables you to keep your plants a little warmer and perhaps control a few other aspects of their growing conditions. You must know what conditions the plant needs and try to create those conditions with your greenhouse. Greenhouses are very labour intensive you must watch the greenhouse carefully and adjust the way you are managing it if the conditions start to vary from what is desired. In the summer this may mean monitoring it every day, particularly if the greenhouse does not have automatic watering and ventilation systems.

You need to decide what you will grow in the greenhouse, and be aware that different plants have different requirements. It may not be possible to grow a great variety of plants in the greenhouse and get the very best out of each one - if each of those plants has different growth requirements.

The Greenhouse System

Thinking of a greenhouse as a system, rather than a structure, will help to reduce problems in the future, consider the following points before choosing a greenhouse system:

- Site - Is it accessible? Take into consideration delivery of materials, access to (and for) customers, available light, wind and other climatic factors i.e. snow, topography, drainage, restrictions through local government by-laws and regulations, what planning permits do you require?.
- Environmental control systems including heating, ventilation and the ability to conserve energy.
- Water supply and irrigation systems
- Availability of other services such as electricity and gas
- The plant production system- including the inputs and outputs of the system
- The availability of labour
- What system will you implement for handling of materials?

The Components of a Greenhouse Facility

The components of a greenhouse system should be determined by the size of the business operation and financial constraints. Some systems may be operated successfully with a fully manual system through appropriate plant choice others will require more sophisticated equipment.

The following is a guideline:

- The floor or foundation - i.e. concrete/gravel (concrete is more generally used to control disease and for ease of movement throughout the larger structure. Walkways in these facilities are usually around 3m wide to facilitate larger machinery.

Assignment 1

Question 1

Give the scientific names of six different species not mentioned elsewhere to date in this subject. For each, indicate which name is the genus, which is the species and (if applicable) which is the variety.

Question 2

If you had a large weed next to your glasshouse, when would you remove it - before it flowers, or after flowering? Explain why.

Question 3

How can you reduce the likelihood of plants dying in your nursery because of a lack of water? List a number of things you can do in point form.

Question 4

What is a glasshouse used for? What is a shade house used for?

Question 5

Submit a report on your set task – suggest the type of set-up that would be most suited to a small nursery and list the components and prices. Explain why you have made these choices.

NOTE: Don't forget your plant identification worksheets.

Congratulations on finishing this

Now start the next section on the next page