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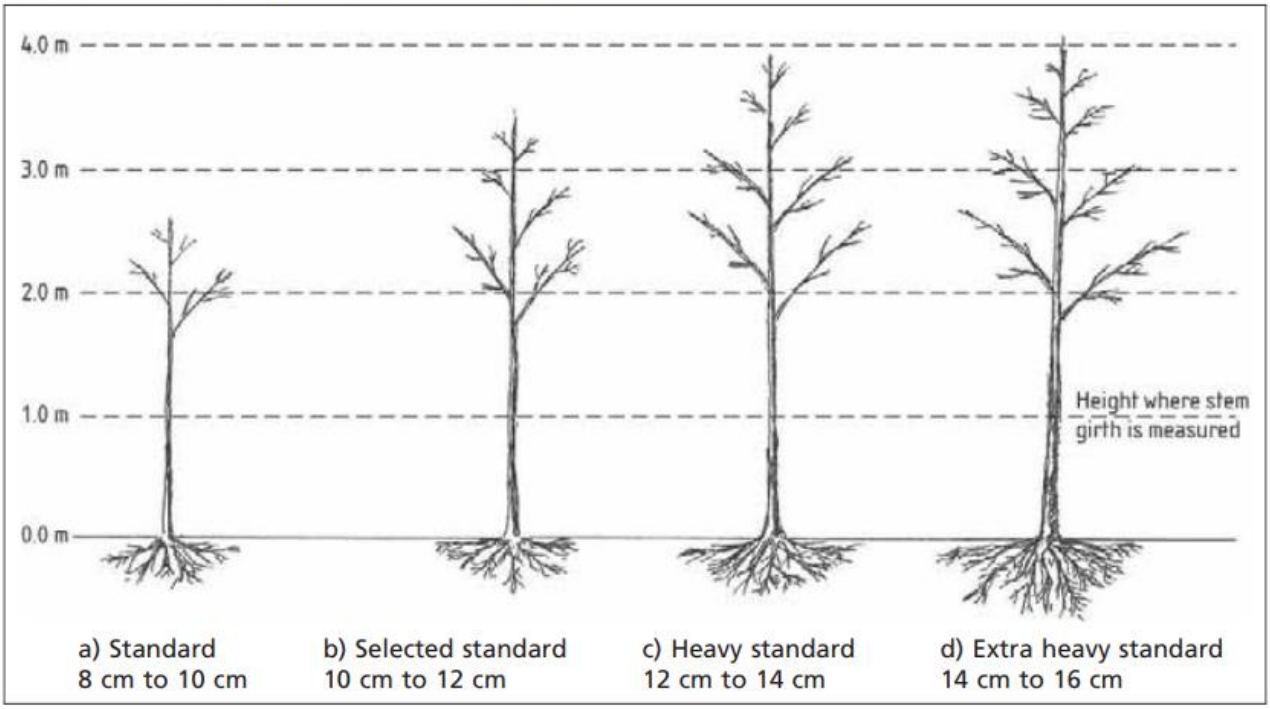
The supply, planting, and aftercare of woody plants
Unit Code: A/602/3936
UNIT GUIDE 2023-24

LO 2. Understand the plant handling process from lifting in the nursery through to storage at the planting site

2.1. Describe the correct procedure for transporting trees from the nursery or storage to the site

Tree nurseries cultivate trees, and BS8545 (2014) - Trees: from nursery to independence in the landscape - recommendations - covers tree care and upkeep. The size of a tree in each designated category is defined by the British Standard. This is to prevent dishonest nurseries from misrepresenting the age of small or young trees they sell for a greater price. Nursery owners unintentionally chop off the main stem to promote faster and wider tree growth.

Figure D.3 **Sizes of young tree nursery stock**



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Whips are trees that are less than 6 cm wide and 1 m tall.

Advantages and disadvantages of containerised, rootballed, and bare root trees, taken from Barcham's Specification Manual for Young Trees
https://www.barchampro.co.uk/wp-content/uploads/2024/02/Specification-Manual-2024-Revised-Edition.pdf

There are three main nursery production technologies used in the UK: containerised, rootballed, and bare root. Trees are taken out of the nursery field and delivered bare root; they are usually packaged singly or in sets and protected with special bags. Bare root trees are often encased in metal cages, hessian, and soil to

protect them. It is crucial to remember that these could be confused for rootballed trees. It should be mentioned that a description of the root system defines each of the production systems.

Bare Root:

After being removed from the nursery field, trees are shipped bare-root and are typically wrapped in specialist bags to protect them individually or in groups. Soil, hessian, and wire cages are frequently used to protect bare-root trees.
You may mistake these for rootballed trees.

Rootballed:

After being repeatedly raised or undercut during the growth process, trees are removed from the nursery field and their fibrous root system, which is housed inside the rootball, is produced.

Photograph illustrating constructed fibrous root system in a correctly prepared rootball which has been undercut repeatedly during the production process.

Containerised trees:

Trees that have been containerised are removed from the nursery field and placed in pots to be grown in. Before being shipped, they are only kept in the container for a little time—one or two seasons. The amount of time spent in the container is essential for the best root formation.

Advantages and disadvantages:

Production System	
BARE ROOT (Open ground)	
Advantages	**Disadvantages**
• The cost of production is lower when compared with other methods, and this is reflected in the supply cost. • Bare root trees are lighter than rootballed and containerised equivalents, and are therefore easier and more economical to handle, transport and plant. • They are less likely to contain soil-borne disease than trees supplied with soil. • This is the best production system for identifying and correcting root deformities prior to planting in the landscape.	• The appropriate time for lifting from the nursery field and transplanting into the landscape is limited to the dormant season. • Not all species are tolerant of the technique. • A significant proportion of fine roots might be damaged at lifting and during transport. • As a general rule, the larger the bare root tree within a given species, the higher the mortality rate, with survivors slow to recover. • Field soil conditions can limit times of lifting and planting, with frozen, very wet and very dry soils being unsatisfactory. • Handling and care of bare root trees between lifting and planting is critical to achieving good survival rates. Roots need to be kept moist at all times, and where there is a delay between lifting and planting, the roots need to be heeled in. • Bare root trees are lifted directly from the field. Each field is part of a crop cycle with lifting occurring over a two/three year period. Often the best trees are lifted first. • Evergreen trees are rarely moved as bare root specimens.

Production System

ROOTBALL
(Ball and burlap)

Advantages	Disadvantages
• The lifting and transplanting season is extended when compared to bare root trees. • Trees that have poor survival percentages when handled bare root can be transplanted successfully. • Trees may be lifted from the nursery field ahead of time and stored above ground if handled correctly. This extends the period for planting beyond the dormant season. • Care between lifting and planting is less critical than for bare root trees as the roots are ideally kept moist and frost-free within the rootball.	• If the nursery practice is poor then as much as 95% of the root system can be lost on lifting. • Actual lifting from the nursery field is limited to the dormant season for all but a very small number of tolerant species. • Handling of large rootballs is labour intensive with rootballs being heavy and awkward to transport. • If the rootball is broken or allowed to shift during handling and despatch, the chances of tree survival are reduced. • Field soil conditions can limit times of lifting, with frozen, very wet and very dry soils being unsatisfactory. • Rootballs are generally more expensive than bare root trees. • Successful transplanting and longevity in the landscape can be adversely affected if the primary root or root flare is too deep within the rootball as a result of poor nursery production. • This is the worst tree production system for identifying and correcting root deformities prior to planting.

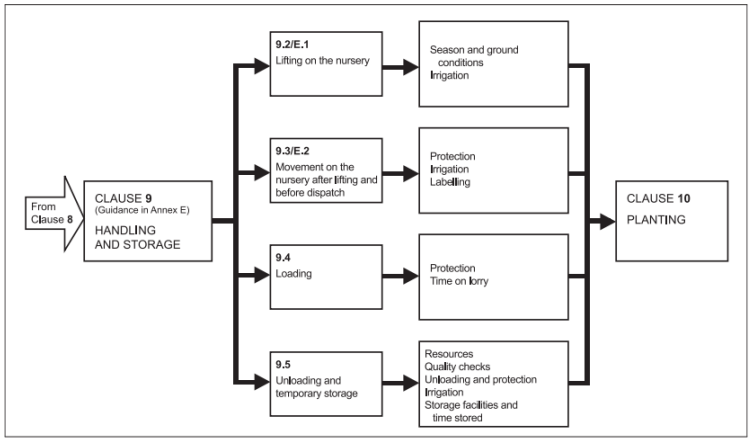
Production System

CONTAINERISED TREES

Advantages	Disadvantages
• The root system is entire and undamaged when it arrives at the planting site.	• Additional irrigation might be needed during the post-transplanting maintenance period.
• Containerised trees can be planted at any time of the year, although soil conditions in the summer can be a limiting factor.	• The organic soil-less compost used in containerised mixes can shrink if allowed to dry out.
• The trees are generally easier to handle than rootballed trees.	• There is the potential for root circling and subsequent root girdling. This is true of all container production systems irrespective of container type. If a tree is left in a container for too long, its roots fill the pot and become distorted.
• The trees are generally easier to store than trees from other production systems.	• If lifted for despatch too early there is a risk that root formation in the container will not be complete and compost will fall away leaving an exposed root system at the time of planting.
• Post-transplanting stress and shock is reduced to a minimum, consequently achieving earlier benefits from planting.	• Some containerisation systems involve the root system being moved from production to despatch packaging. This movement can result in drying out and or root damage.
• Containerised trees generally weigh less than rootballed trees, as the growing media used is usually organic rather than soil based.	• Containerised trees are generally more expensive than bare root or rootballed trees.
• Trees are not lifted directly from the nursery field for despatch and are unlikely to have suffered root damage.	• Movement from smaller to larger containers can result in root deformation and delayed failure in the landscape.
• Irrigation and nutrition can be regularly monitored and easily adjusted throughout the production process on the nursery and any subsequent storage period prior to planting.	• Containerisation can result in the root flare being buried too deep in the container.
• Trees are grown in a controlled environment throughout the production process.	

The appropriate method for transporting trees from the nursery or storage to the site is described in BS8545, using an Extra Heavy Standard as an illustrative example. Please refer to the process chart provided below:

Figure 6 **Process flowchart for handling and storage**



https://e-planning.worcestershire.gov.uk/swift/MediaTemp/1250-32912.pdf

As long as they receive adequate water, containerised or rootballed trees, such as Extra Heavy Standard trees, can be carried throughout the year. Since these trees are hefty, they must be placed on a vehicle near their growth location. To raise and move the trees, a suitable number of individuals with manual handling training are required.

Ancient Olive Tree extra-large £4,250.00

For biosecurity purposes, every tree needs to have a label that includes the species name, the date of planting, the nursery's name, and any areas where it has been grown. The buyer's name and the order number must be added when the tree is sold.
Extremely Heavy Standard trees require protection during transportation because they are more costly than whips. To prevent damage or overturning, they must be stored on a truck. When designing the route, care must be given to ensure that low bridges and other obstacles will not harm the trees.

Lifting trees onto the flatbed truck might require a forklift vehicle. Should the trees be removed, caution must be exercised because, in cold weather, the roots may break. In addition to considering watering the trees as needed, security should be considered if the travel is lengthy and may need camping.
A phytosanitary certificate is required when importing some plants into the UK from overseas. To keep illnesses and pests out of the UK, this biosecurity safeguard is in place.
Before planting, the trees must be unloaded and stored at the location. To ensure that the right trees are delivered, that they are undamaged, and that they are placed in the proper storage area before planting, the customer must be present when the trees are being offloaded.
The client must be guaranteed that all biosecurity protocols have been followed and that the trees are free of pests and diseases.

2.2. Describe the correct process of protecting bare root stock at the site of planting before planting

Because they are light and compact, bare root stock trees are typically packed into groups of five for transportation. It can take a few days or weeks until they are planted, so even if they are delivered to the location before planting, they still need to be secured. To maintain moisture, the tree roots can be submerged in alginate, a seaweed solution, or submerged in water and sealed in a co-extruded bag. To deflect heat, these bags have a white exterior and a black interior.
The bare root trees may need to be "heeled in" before planting, depending on the location. To accomplish this, excavate a trench, insert the tree bundles upright, and then backfill the trench with dirt, wood chips, or another biomaterial. Digging the trench with one side at a 45-degree angle will help ensure that the bare root trees lie at an angle and will not be blown over if they are in singles. It is important to identify or mark the trees when heeling in so that it is obvious which species they are and where they will be planted.

Before planting, bare root trees must also be shielded against theft and vandalism. It is prudent management practice to keep track of the precise number and kind of trees brought to the site since this will provide documentation for any eventualities and support an insurance claim.
To avoid paying the provider too much, this information is also necessary.
Upon delivery, the trees must be inspected for pests and diseases to avoid any infestation that could harm the entire consignment. When delaying a delivery or refusing to pay the whole invoice, taking pictures of any impacted stock is an excellent way to provide evidence.

https://www.gov.uk/guidance/import-plants-and-plant-products-from-the-eu-to-great-britain#:~:text=To%20import%20regulated%20plants%20and,has%20been%20officially%20inspected