3. PLANTING TECHNIQUES AND POST-PLANTING CULTIVATION TREATMENTS

Should it be desired to plant a cypress tree, either in replacement of one that has been felled for sanitary reasons, or in the case of a new ornamental tree, it is necessary to know some basic information for correctly handling the phases that range from the choice of the vegetal material to be used to the planting itself and to all those subsequent cultivation treatments that may have a big influence on the success of the planting and on the survival of the plant.

3.1 Realisation of the planting

3.1.1 Choice of the vegetal material

It is essential to plan the typology of cypress trees to be planted out, keeping in mind that nurseries have at their disposal plants that in general are obtained through grafting and are grown both in pots and in the soil (Figs. 77-78). In both cultivation typologies, we can readily find subjects of a height of between 1 and 5 metres. In several nurseries, however, even much taller specimens are also available. It is advisable to address to nurserymen of proven experience in the sector, preferably persons who can supply plants that are resistant to Seiridium cardinale (agent of cypress canker disease). Cypresses patented for their resistance to canker must always be
accompanied by the progressively-numbered special tag that guarantees their correspondence to the clones patented by the Institute of Plant Protection of the National Research Council (IPP-CNR) (Fig. 79).

Both plants grown in pots and those raised in the field, which have been balled and burlapped, can be planted out. Both typologies of cultivation present several positive aspects and other negative ones which it is best to know.

**Plants in pots**: to evaluate the aptitude for planting trees in containers, it is best to be acquainted with the number of passages, from the smallest pot to the largest one, to which the cypress tree has been submitted during its cultivation in the nursery. The increase in the number of re-potting operations normally corresponds to a better root conformation and a greater capacity for overcoming a transplant crisis after the definitive planting out. At the moment that it leaves the nursery, the plant must have spent at least one complete vegetative season there, in the same container with which it was delivered.

**Plants balled**: the plants that have grown in the soil and extracted with a root ball must be cultivated by following all the cares necessary so that most of the capillary roots are located inside the clod. The cultivation treatments aimed at this goal, which are to be performed in the nursery in the years prior to the definitive planting out, can be summarised in the cutting of the roots on the spot, in pre-balling, or in the transplanting from one cultivation zone to another. To facilitate the development of many absorbent roots inside the ball, it is also important that the cultivation take place in soils that are not too compact, and that during all the cypress-cultivation phases the nurseryman provide an ever-constant and concentrated supply of water and nutritive elements on the most superficial part of the soil. After the extraction from the soil, the ball of the plant must
be well protected, in order to limit the losses of humidity, and must be maintained whole by enveloping it, on the external part, with very taut steel netting or with other restraining materials. The time elapsing between the extraction of the soil and the subsequent bedding out must be reduced to a minimum, maintaining the plants well protected and sheltered from both the wind and the heat during all the phases, including that of transportation.

As far as the sanitation condition of the plants on leaving the nursery is concerned, this must always be carefully controlled by the seller and possibly also by the purchaser, discarding the subjects that have been damaged by agents of a biotic or abiotic origin. The selection must be particularly severe, both for the spreading of the pathogens, and also for the agents that can reduce or compromise the commercial quality of the product and the success of the planting itself.

The request for plants to a nurseryman should be made well in advance as regards the planting time, so that the availability of ornamental plants at the nurseries should be ascertained. The purchase order will have to specify the species, the clone, or the aesthetic characteristics, the type of cultivation, the supply procedure and times, as well as the expiry dates. Hurried purchases may mean that the use of proper nursery material is not guaranteed.

3.1.2 Planting period

The most suitable periods for transplanting cypress trees are limited to the spring, i.e. in April, immediately after the beginning of the growth, or else to the end of summer, in August-September. Plants cultivated in pots can be planted out even in periods that are not ideal, provided that an adequate supply of water is regularly guaranteed to the plants even in winter.

3.1.3 Preparation of the soil

The success of a planting is often conditioned by the preparation of the soil. This can be extended to the entire surface, or limited to the space occupied by the individual plants or by the rows. In realising ornamental plantings, in addition to the surface arrangement of the ground level, it is advisable to open up some holes (using any sort of means, possibly excluding mechanical borers, so as to avoid the “pot” effect, above all in clayey soils) (Fig. 80), which are wider and deeper than the space necessary for containing the root ball.

In the case of rows, for windbreak or for other types of barriers, with a distance between the plants in the row that is no greater than 3 metres, as an alternative to the opening up of single holes it is advisable to dig a trench for the entire length of the row with a depth and width that are broader than the root balls of the plants. It is always necessary to guarantee drainage by making it flow into a collector or onto another point that guarantees the draining of the excess water.
Excellent results in taking root and a good development of the plants are obtained by previously arranging the holes or the trenches with a depth that is double compared to the height of the root ball, and by bringing back a mixture, more or less in equal parts, of soil and mature manure to the bottom of the excavation. In addition to being important for a correct nutrition on the part of the plant, the bovine organic substance constitutes a stimulus for making the roots descend in depth, thus improving the plant’s natural anchoring to the soil (greater stability) and favouring the exploration of layers of soil with fewer risks of water shortage. Everything must be covered with only one layer of unfertilised soil, about 10 cm deep, and intended for separating the roots from direct contact with the manure (Fig. 81).

At the end of these first preparatory interventions, the depth of the hole or of the trench still to be filled must correspond perfectly with the height of the root ball of the plant. After the bedding out of cypresses, the filling of the holes and trenches can be carried out with the same excavation soil if this is of good quality, or else with specially prepared compost. It is advisable to avoid the use of components with an acid reaction, such as peat, for example. Likewise to be avoided for the first year, are mineral fertilisers, due to the risk of supplying an over-abundance of nutritive elements (“caustic” action), compared to the scarce absorption ability of the plant, which is linked to the reduced extension of the roots.

3.1.4 Planting distance

The distances between one plant and another inside parks and gardens are not linked to particular parameters, but can be defined in relation to the
aesthetic goals that it is desired to attain. When the cypress tree is utilised to constitute a group, which is normally formed of three plants close together and intended to represent a point of attention and of reference on the territory, the trees are generally planted out on the vertices of an equilateral triangle, ideally traced on the soil with sides varying in length from 150 to 200 cm (Fig. 82).

For the setting up of rows that have aesthetic purposes, it is advisable to maintain distances that leave sufficiently wide spaces between one plant and another, which normally are not less than 3 or 4 metres. Should it be intended to plant out rows of cypresses to function as hedges or even windbreak and anti-noise barriers, it is best to evaluate the distances between one plant and another very carefully, keeping in mind the shape that the trees will assume when adults. In a completely empirical way, the distance between the trees can be indicated, on an average, as being equal to one quarter of the maximum definitive height predicted for the row. If, for example, we wish to realise a barrier to be maintained pruned at a height of 6 metres, using cypress trees with a not overly narrow habit, such as the “Agrimed 1” clone patented by I.P.P., it will be advisable to plant out the trees at a distance of 1.5 metres (Fig. 83).

More efficient windbreak barriers can be realised by planting the cypresses in two or more parallel rows, with a preference for the quincunx type of arrangement, rather than in a square. In order to improve the result from an aesthetic point of view, while maintaining the effectiveness of a barrier, the outer row can be realised with plants that have a pleasant column-like habit, such as, for example, the “Bolgheri”, “Italico” or “Mediterraneo” clones, patented by I.P.P.
3.1.5 Bedding out the plants

At the moment of bedding out the plants grown in pots, particular attention must be given to the separation of root ball from the pot, so that both the loss of compactness of the latter are avoided. Disintegration would compromise the contact of the absorbent roots with the surrounding terrain, and would have negative consequences on the taking root of the plant. For balled plants, instead, it is advisable to verify whether the rags or other protective and constraining materials of the root ball are degradable and leave the roots the possibility of growing. Even the netting that is often used for maintaining the root ball upright must be of the easily oxidisable type, to the point that it decomposes prior to limiting the development of the roots. Should the degradability not be guaranteed, after having positioned the plant over the hole, it is necessary to eliminate all the barriers that envelop the root ball.

It is very important that, just as for all other plants in general, the planting level of a cypress correspond perfectly to the collar and that this result be in any case attained after the necessary settlings of the soil brought back over the hole. For the loading, transportation, and unloading, as well as for depositing the plant in the hole, special connecting, tying and binding systems that do not damage the bark of the trunk and the other parts of the plant must be used.

3.1.6 Anchoring the plants

Anchoring cypress trees can be done using poles and stakes or with sunken systems that are invisible. Should stakes be utilised, the choice must fall on ones that are sufficiently strong and long so that the trunk can be firmly blocked on a point that is as high as possible. Various methods can be used, both with two stakes placed vertically and surmounted by a crossbar on top (Fig. 84), or with three tilted stakes that are convergent at the summit with the main axis of the plant (Fig. 85). In both systems, it is
essential that at least the fourth part of the length of the stakes be well planted stably in the ground, in an external position as compared with the trunk of the cypress tree. Use of plastic drawstrings that have sufficient elasticity is recommended to fasten firmly the stakes to the cypress stem. In order not to damage the plant, bindings realised with thin or sharp wires must be avoided, while it may be convenient to circle the trunk with barrier-type materials that avoid the direct friction of the drawstrings on the bark of the tree, prior to arranging the fastening.

As an alternative to stakes, there exist special anchorages on the market that are to be installed below ground level and can make the plant firm without being visible on the outside. Even if they are more costly compared with the visible type, these methods are particularly appreciated in certain environments where the aesthetic aspect exceeds the economic aspect in importance.

A underground anchorage system, which is very economical and efficient, above all if applied to plants with a height of up to 3-4 metres, can be realised by arranging several brackets with the iron reinforcement rods commonly used in the building trade for reinforced concrete. The reinforcement rod must be cut into parts no longer than 3 times the diameter of the root ball for the plant that is to be anchored, and must have a diameter equal to approximately 1/100 of its length. After having sharpened the two ends well, two flexions are realised at a right angle so as to form an upside-down U-shaped bracket with the upper part perfectly straight and the two descending pieces suitable for being driven into the ground. The first one is placed on the middle of the radius of the root ball and the second, in the compact soil immediately outside the hole prepared for the plant. Each of the two parts to be introduced into the soil must be equal to ¼ of the total length of the reinforcement rod. For example, to anchor plants with a root ball that has a diameter of 60 cm, the reinforcement rod must be cut into pieces that are about 180 cm long, and must have a diameter of no less than 18 mm. After the flexion, the level part must measure about 90 cm, and the two descending parts, 45 cm each. To obtain a good anchorage to the ground, at least 4 brackets are necessary (better if there are 6), anchored very deeply, arranged in a radial manner, and well distributed over the entire circumference of the hole. After having made the brackets penetrate the ground, it suffices to cover the whole thing with a light layer of soil in order to make the anchorage invisible on the outside.

3.1.7 Protection of the plants

If the planting is realised in places where the presence of lagomorphs (rabbits and hares) and/or ungulates (roe deer, fallow deer, wild boar) can be hypothesised, it is extremely advisable to protect the plants from the bites of these animals.

The said protection may regard the individual plants by means of special shelters (Fig. 86), i.e. cylinders of plastic or metallic mesh, the height of
which must be adapted to the type of hypothetical damage caused by these wild animals (for roe deer: 1.20 metres; for hares: 60 cm). Alternatively, even if the costs are definitely higher, an attempt can be made to protect the entire plantation, with a collective fencing that must be at least 2 metres high in order to prevent the entry of several larger-size ungulates (fallow deer and red deer) (Fig. 87).

3.2 Post-planting cultivation treatments

3.2.1 Irrigation

It is always essential to guarantee the plants a constant supply of water at the level of the root system for at least the first and possibly also for the second vegetative season after the planting. Should the first two winter seasons, after the bedding out, be characterised by a repetition of windy days or by the absence of rainfall, it becomes necessary to irrigate also during the cold season, limiting the interventions to the warmest hours of the day. In fact, cypresses need a constant and adequate supply of water even in winter, to compensate for the high transpiration that distinguishes the species even during the vegetative rest period, since it is an evergreen. To improve the air circulation in contact with the new roots and to obtain the greatest efficacy in the irrigation interventions, it is advisable to be equipped with pieces of perforated piping of the same type used for underground draining in agriculture, to be positioned inside the excavations (Fig. 88). Once in operation, the pipe must form a “U”, the basal part of
which must be horizontally located immediately below the root ball of the plant. The two terminal parts must be positioned vertically until they emerge for a few centimetres above ground level (Fig. 89). The two entry holes must be maintained suitably closed with stoppers, in order to prevent possible insects or small mammals from entering. The drainpipe, which has a diameter of 50 mm or more, may be utilised both for emergency irrigation
operations and also for making the nutrients, dissolved in water, arrive to the level of the roots.

Also possible irrigation systems of the “driblet” type, or other similar low-pressure ones, can run a part of the irrigated water into the drainpipe. When the planting is effected over a trench, as suggested earlier for the rows, a single drainpipe can also guarantee the underground irrigation of several plants, provided that the part lying horizontally under the root balls of the cypresses is placed entirely on the same level.

The use of the drainpipe, which favours the dispersion of liquids in direct contact with the deep roots, makes it possible to obtain more effective and longer-lasting results, compared to those that are attainable with any other method that limits the distribution of water to the more superficial part of the soil. The most evident advantages refer to the prompt effect, to the smaller water losses due to evaporation, as well as to the greater growth of the deeper roots as compared to those on the surface. The development in depth of the roots improves the natural anchoring of the plant to the soil, and reduces its predisposition to water stresses.

3.2.2 Monitoring

After the planting, it is important to pay constant attention to the necessary watering and to the health condition of the plants. The stability of the trees must also be kept under control, with periodic check of the solidity of the restraints and of the stakes. The latter may be removed only 2 or 3 years after the planting, when the resistance of the cypresses to bad weather conditions will be assured by the anchorage in depth of the new roots.