



Production discipline for sustainable production of short term poplar tree cultivation

Biennial shift

Year 2006 – Number 1

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Premise

The present discipline has been conceived in order to pursue two objectives: the first being that of guaranteeing finished product quality for the transformer and the end user, the second in order to correctly focus the producer in relation to the cultivation techniques to be adopted during the entire production process,

In line with that envisaged in national directives and the certification regulations currently in force, the following paragraphs provide a description of the technical means and procedures to be adopted, as permitted by the C.N.E.R. (National Consortium of Renewable agricultural energy), so as to be able to define the product as being

“certified”. Each paragraph provides details on the operations and the technical procedures to be adopted, together with that specifically to be avoided or forbidden. Everything not clearly specified in the present norms to be considered as being inapplicable.

1. Plantation localization

The land to be used for the plantation must have certain features. Once the site has been chosen it is necessary to assess the following aspects:

- a) easy access of the means for harvesting, and loading and transportation of woody materials;
- b) and excellent soil conditions so as to permit all mechanical operations to be effected;
- c) any crossing of electrical and/or phone cables;
- d) gradient.

The sites are to be easily accessible if they have an entry road, carriage worthy roads, bridges and borders of a minimum length of 5 metres which are free of obstacles making manoeuvres easy using mechanical means.

The land is considered as being suitable for plantation when the site is of a regular shape, to permit longitudinal operations for at least 100 metres in length..

In the event of the presence of long distance power lines on the sites, suitable measures must be taken to avoid the risk of plant growth causing damage or disturbance to the cables. So that it will be necessary to remove the cuttings in the protective area beneath the cables themselves, which must be undertaken immediately after the transplantation operations. A maximum slope gradient of 10% is permitted.

2. Type of soil

Fertile soil is preferred, which is deep and permeable with a good absorbency and superficial layer, with a clay-lime or clay-lime-sandy texture, PH ranging from sub-acidic to moderately alkaline.

The following soil types are to be avoided:

- a) clayey soils or those with a clay content of over 50%, together with a sandy content of at least 25%;
- b) gravely soils, with a coarse gravel content of over 35%;
- c) peat soils, or those with an organic content of over 6% or in the presence of a high percentage of peat of swampy organic deposits;
- d) excessively acidic, with PH of under 4.5;
- e) excessively alkaline with a PH exceeding 8,5;
- f) with a reduced field capacity, or with a colloid/sand ratio that favours these last, situated in climatic zones in which the annual rainfall does not exceed 700 mm, the intensity of which is concentrated in the autumn-winter period. Even if the soils have these features, it will be possible to proceed with plantation only providing that the company undertakes irrigation techniques, particularly in the summer months, each time that the first 10/15 cm of soil appears to be dry.
- g) salinity exceeding 0,40;
- h) total lime content exceeding 20% and 15% active;
- i) with flooding risk for over a month;
- j) with a surface area of under 2 hectares.

Those soils at risk through water retention must also be provided with an optimal water channel system, with agronomic interventions which favour soil permeability (breakage of the working surface soil) and water flow from the exterior (packing and trenching systems).

It is in any event necessary to make sure of the presence and development of any indigenous poplars in the surrounding area; this is essential in order to determine the suitability of the station for the cultivation of the short-cycle poplar. In the event of the total absence or any doubts on the above-cited features, it is necessary to undertake analysis of the soil destined for the plantation itself, using officially certified laboratories.

Cultivation is not permitted on land previously managed in terms of multi-annual turfed setaside.

It is also very important to monitor the quality and the quantity of infesting plants presents in order to carry out the necessary weed killing operations, in particular in the presence of wide spread or concentrated weed infestation such as *Convolvulus arvensis* or in the event of serious infestation by *Artemisia spp*, by preparing a reclamation plant before plantation.

3. Fertilization of the plantation

The quantity of fertilizers to be used must be in line with the actual cultivation needs and the pedological conditions of the soil.

For the preparation of new plantations extending for a surface area of over 5 hectares chemical soil analysis is required.

Organic fertilization is permitted using only those materials that do not risk causing any environmental risks.

The solid organic fertilizers, during the year of plantation must be spored before the actual transplant, during the soil surface preparation stage by means of even superficial burying.

Fluid organic fertilizers may also be used in the covering, but they need to be distributed using suitable equipment in order to prevent any unpleasant odour (cistern trucks with diggers).

However the use of any liquid fertilizer, manure or any other organic fertilizers is prohibited unless it complies with the legal requisites as envisaged in the Legislative decree no. 508 implementing the Council Directive 90/667/CEE dated 27th November 1990.

The maximum limits of base organic fertilizers are as follows:

Product	Kg/ha	Kg/N/ha
Manure	50.000	150
Compost	15.000	225

It is forbidden to exceed the maximum nitrogen quantity (to be added through organic fertilizers) as envisaged by national and regional good agricultural practice regulations. The soil may alternatively be fertilized by the addition of the following elements in the form of chemical manure:

Product	Kg/ha
Nitrogen	150
Phosphorous*	120
Potassium*	250

Nitrogen additions in ureic or nitro-ammonia form must be undertaken in the first year and positioned along the transplant rows so as to allow the young tree to immediately absorb the element, preventing the risk of a loss of lixiviation..

The addition of phosphorous and potassium is only permitted providing that there is a proven lack of the same.

4 Covering fertilization after the first plantation year

The following organic covering fertilizers may be added to the cultivation, following felling and before the restoration of vegetative growth chosen according to availability:

Product	Kg/ha	Kg/N/ha
Humid Borlande	5.000	75
Liquid manure	20.000	80

As from the second year and at the start of each two-year period, in the absence of any organic fertilizers, and always before the resumption of vegetative growth it will be possible to add the following chemical fertilizers:

Product	Kg/ha
Nitrogen	80

The fertilizers must also be used in a form that is not easy to wash out.

5. Nursery propagation material

The use of Genetically modified organisms is forbidden (Directive 90/22/CEE).

Due to the particular nature of the cultivation it will be necessary to use cuttings that are certified and regularly registered in the National Registry of Forest clones. The clones permitted for 2005 are Sirio, AF2 and Monviso.

AF2 may be used in the most productive lands, Monviso in those lands of lesser fertility and Sirio on soils that tend to be clayey.

The cuttings to be used must be in compliance with those envisaged by the National Community legislation in force, they should be well developed, correct in terms of shape, and must be free of any moulds, parasites and obvious signs of rooting and early budding. All the nursery material must be kept moist and fresh until all the transplantation operations are complete.

6. Plantation lay-out

In the case of clones Sirio and AF2 the plantation lay-out must be of 300 cm between the rows and of 60 cm on the row (equivalent to 5,556 plants per hectare). While in the case of the Monviso clone the plantation lay-out must be of 300 cm between the rows and of 50 cm on the row (equivalent to 5,556 plants per hectare).

In order to adapt the cultivation to any mechanical means already present in the company an increase in the distance between rows is permitted, up to a maximum of 10%, providing that the end investment is respected.

In the event of a golena plantation the rows must be planted in the same direction as the river current.

A distance of at least 3 metres must be maintained from the edges, or sufficient to ensure that the local regulations and laws are respected.

In order to permit any mechanical machine manoeuvres at the ends of the plot, a space of at least 7 metres must be allowed.

7. Transplant

The transplantation operation must be undertaken on soil that has been rendered suitable by means of special treatments using harrows.

The cuttings must be placed so that they perfectly adhere with the ground. They must be planted with buds directed upwards and they must not escape from the ground by more than 3 cm.

The plantation must be made during the vegetation respite cycle of the cuttings, that is, within 30th April each year.

Periods of frost must be avoided as it may hinder the correct positioning of the cuttings.

It is essential to proceed with plantation before the opening of the buds. It is important to reduce the lapse of time between cutting consignment and their bedding by as much as possible.

During the transplant operations it will be necessary to take all the necessary precautions to ensure the perfect conservation of the cuttings, in terms of their possible dehydration. As from the month of April the bedded cuttings must be transplanted to a shady area, covered by a white sheet and moistened by water spraying.

8. Chemical weed killing

It is essential to ensure that all weeds are kept at bay particularly during the first year of plantation; so that the use of chemical weed killer is permitted. It may be undertaken during the post-transplantation stage and subsequently on felling, during the phase of pre-emission of new pollens.

Weed-killers may be distributed by positioning on the row, or in open field.

During the post-transplantation stage the following anti-germinative active ingredients are permitted: *oxadiazon*, *oxifluorfen* and *pendimethalin*.

As from the month of April the post-transplant weeding killing operation must be undertaken within the day after the cutting transplant.

At the start of each new cycle, after felling, and before the issue of new pollens, *gluphosinate ammonium* is permitted.

In the event of infestation by *Convolvulus arvensis*, it must be allowed to develop parallel to the ground for approx. 70 centimetres and treated using a glyphosate weed killer using screened bell sprayers so as to prevent the risk of affecting the cultivations underway. This treatment may be undertaken several times during which inter-row harrowing must be suspended, until it has completely dried out.

The quantitative and dosage of all the active ingredients must be used in accordance with the instructions as envisaged by ministerial legislation and indicated on the label.

9. Monitoring operations

At the end of each transplant and weeding operation it is necessary to monitor the results in order to correct any errors that may have occurred during the operations effected up to this time.

These monitoring operations must be undertaken in a period of time between the 15th and the 45th day from the date of transplant.

They should involve the following aspects:

- a) check that the pollen vigour is sufficient
- b) the efficiency of the weed killing treatment undertaken and the emergency state of the main perennial and annual weeds;
- c) the regular distance between the rows and on the rows of the plantation, which must always be checked right from the start of the transplant operations.
- d) the total percentage of root taking, considering a maximum tolerance of 10%;
- e) the correct (upwards) position of the cuttings, bearing in mind a maximum deformity tolerance of 3%;
- f) that the cuttings have been regularly removed in the protection space beneath the power supply lines and telephone cables; so that the distance from the ground is of under 10 metres.

In the event of deformity exceed the permitted levels, the CNER engineer will be obliged to:

- a) inform the material executors of the irregularities found;
- b) to take all the necessary steps to redress the situation to within legal limits.

All the monitoring data will be recorded by the engineer on special official forms and gathered together on a special portal so that they can always be checked.

10. Working the soil after harvesting

It is obligatory, within the first ten days of June, to undertake at least one treatment on the rows using a suitable multi-mower device, complete with pressing tool; this will complete the effects of the chemical weed-killing treatment and the young trees will be sure of the beneficial effects of hoeing and pressing.

In order to complete the weed control operations and to improve soil texture and permeability and avoid excessive transpiration, regular harrowing is also essential.

Turfing between the rows is not possible, if not for environmental reasons; however in such a case turfing should be limited to repeated cuts in order to limit water consumption and the competition between root systems; in the event of any signs of suffering the grass turf must be immediately removed, using a harrow or clod crusher.

During the first two years of cultivation regular harrowing is essential, to sufficient extent to ensure that the weeds are kept to within a maximum height of 30 cm.

As regards implements, disc harrows are preferred or a *vibrocultor* the use of cutters is to be totally avoided as they have a negative effect on the soil packing and on the formation of the working soil.

11. Phyto-sanitary treatments

All phyto-sanitary treatments must be undertaken according to the specific needs of the individual event and must not be considered as being part of general preventive programmes.

The quantities and doses of all the active ingredients must be made according to the provisions laid down by ministerial documents and that specified on the label. All those products with a far reaching impact must be avoided and low-environmental impact techniques are to be used as envisaged by national and regional bodies, even in the event of the absence of any specific disciplines in relation to the poplar tree.

Particular attention should be taken as regards the poplar (*Melasoma populi*).

Should a significant presence of the same be noted in the month of April, it should be treated well in advance with piretroid or nicotinoid products, to prevent the risk of subsequent reproduction of the insect.

In any event treatments should be made only once the damage threshold has been exceeded, which must be checked each time by the technician in charge.

Each intervention and product used must be recorded in the treatment register.

All the means used for the treatment must be undertaken in accordance with current safety laws. It is necessary to eliminate all weeds that exceed a height of 30 cm, as being a refuge for *Saperda Maggiore* (*Saperda carcharias*).

Where possible intervention will be necessary with biological means such as *Bacillus thuringiensis* spp.

12. Harvest

The harvest must be undertaken at the end of each two-year cycle, during the negative pause in the cultivation cycle, in the period between the complete loss of leaves, the restoration of the vegetative cycle and the opening of the buds.

Each harvesting operation must be undertaken with the ground in such conditions as to be able to support the passage of mechanical harvesting means, without jeopardizing the intrinsic structure.

For this purpose it is envisaged that the harvesting operation can be undertaken on various sites and in different periods, so as to exploit the most favourable seasonal periods.

The tree stumps must be cut to a maximum of 10 centimetres from the ground, in order to ensure that the cutting level is not progressively raised through time causing problems for subsequent cutting operations.

The reference humidity level of the product, in green state, is of 55%.

In the case of the cut product it must be sent for final use within three days of the date on which it was accumulated.

13. Post-harvesting and explantation operations

The post-harvest operations may relate to the re-starting of the cultivation for the new productive shifts already initially planned, or the recovery of the soil for use in new types of cultivations.

In the event of the re-starting of a cultivation cycle, the cultivation must be put into such conditions as to be able to issue new shoots in such a position as to give it an advantage over the infesting weeds and with sufficient nitrogen reserves. So that in the month of March it will be necessary to check for the presence of any infesting weeds and the nutritional state of the stumps, in order to

evaluate whether it might be necessary to intervene using an weed killing or fertilizing products. In which case it will be necessary to adopt the measures as envisaged in point 3 and 8 of the present specifications.

Should it be necessary to initiate new sowing at the end of the production cycle, the land may be prepared for re-use, using a special forestation device (milling machine), to be used between the rows.

This operation will ensure, in two easy steps, the crushing of the stumps, the destruction of the roots and the preparation of new sowing operations.

14. Registrations and certifications

In the event of the voluntary certification of the product, the company must keep a special register for each surface area that is homogeneous in terms of features and plantation times, in which the following details will be recorded:

- a) the land register and planimetric details of the land;
- b) the raw materials purchased;
- c) details on how they were used and the dates;
- d) the operations undertaken;
- e) the compliance with the required regulations.

The cultivation register will act as the fundamental document for the respect of the norms envisaged in the regulation.

The nomination by the CNER of an inspection manager is envisaged, who will monitor that the cultivation progress conditions are recorded, and who will also certify the relative cultivation register.

The register will be given to the company at the start of the cultivation operations and it will be prepared for the necessary registrations, in clear steps, in full accordance with the objectives of the present regulations.

It may also be overseen by a technician using at IT programmes and systems that may be available. All the operations must be punctually registered in the relative spaces, in accordance with the envisaged procedures.

15. Validity

The present specifications are valid as from 2006, up until the time of a new revision. This is the first and therefore bears the number 1.

16. Revisions and ownership

The definition of the norms of the present specifications is based on the experience acquired and therefore in the event of any cases of non-application, or any other experimented systems and/or technical means of greater efficiency it may be subject to re-examination.

Any re-examination must be made within December 2006 and the new specifications will be given a subsequent number order.

The intellectual ownership rights of the present specifications belongs to:

C.N.E.R.

National consortium of Renewable Agricultural resources

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