



Abstract

Conservazione del C organico del terreno in vivaio mediante l'impiego di compost (VivComp)

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Abstract

Of great importance in the ornamental nursery is the production of trees and shrubs, whose cultivation can be done in the open field or in a container. Despite the cultivation of ornamental plants and fruit trees in pots is to be progressively more widespread in recent years, the production of plants on soil continues to maintain a certain interest. This especially for species in the medium - short crop cycle for which the direct cultivation in the soil provides greater and faster growths . However, if the plant is marketed with root ball, part of the fertile soil is removed. This activity leads to a gradual deterioration of soil fertility , precisely because of the removal of the active layer. The phenomenon is intensified if the nursery is characterized by continuous growing cycles. The nurseryman usually tries to restore the soil fertility by acting with manure supply. This resource, however, is not always available whereas are becoming more readily available organic matrices of anthropogenic waste such as compost (mixed composted soil improver).

Experiments carried out on agricultural crops showed that the organic products use, in partial or total replacement of chemical fertilization, allows to maintain or increase yields improving the soil at the same time. For example by reducing the apparent density, or increasing the permeability of the ground surface, porosity, aggregate stability, and water availability for plants. In relation to woody species, some tests have shown that the incorporation of plant products waste improved the vegetative growth, the roots elongation and the quality of the transplanted azaleas. Other experiments showed the positive effects of long-term compost supply on soil organic C. Despite these positive findings, the compost is still little used, especially for the high cost due to the large volumes that are needed and the distribution compared to mineral fertilizers.

This project investigates the possibility of compost using and promote it as part of the nursery industry. The first aim of this project is to evaluate the possibility of using compost as organic fertilizer instead of manure to improve in the short-medium term, the amount of organic carbon in the nursery soil; secondly to assess the response of trees and shrubs crop (hornbeam, privet, hibiscus and osmanthus), to check if the compost can replace or supply the mineral fertilization over time.

In this sense, the experimental tests were carried out in the open field, on the medium-short-cycle crops, comparing the plants performance grown on soil fertilized with mineral products, with manure and compost. In addition to the plants growth traits, soil analysis were carried out in order to verify the concentrations change of organic carbon in the soil and other aspects of fertility. Another trial investigated the quality of the products obtained with bare-root or root ball and, in

respect of the promptly plants rooting when grown again in pots or planted. The plant performances have been assessed as canopy growth and roots system quality.

The results obtained in the tests at the two companies (Simeoni and Botter) were similar. The two species used (*H. syriacus* and *O. crenata*) are comparable between them, in relation to the fertilization type. However, in both companies *H. syriacus* showed higher growth index values with compost fertilization, compared to the other treatments. For the *O. aquifolium*, no significant differences between treatments was observed. This could be due to a different use ability of available nutrients in different times from three sources (compost, manure and mineral).

Even when growth indexes were different (eg. *H. syriacus* fertilized with compost), these differences were not statistically significant. About mineralization rates of compost and manure and the availability of nutrients from mineral fertilizers, differences were not such as to differentiate the crop response. This suggests, as reported also in literature, that soil needs repeated and prolonged applications in time of these organic fertilizers before showing a variation of its chemical-physical characteristics. This time is necessary to differentiate edaphic flora allowing the organic matter mineralization and therefore the release of nutrients, near the crops needs. Time is necessary also to achieve a significant organic carbon amount in the soil useful to modify the physical characteristics with a relative increase in organic carbon.

This is true for all organic matrices especially in the case of the compost matrix that looks like more or less stabilized. It should, finally, be noticed that a non-highlighted difference between treatments fertilized with organic matrices and the mineral one has to be considered positive. As reported previously, the organic fertilization can completely replace the mineral one without any worsening the quality of production. This, in the long time, may also allow an organic carbon increase in the soil and improve soil fertility leading to a production improvement.