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Kenaf (*Hibiscus cannabinus* L.) core and rice hulls as components of container media for growing *Pinus halepensis* M. seedlings

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Abstract

The feasibility of replacing peat or perlite with rice hulls and ground kenaf core to grow a Mediterranean species (*Pinus halepensis* M.), was investigated. Treatments involved the following growing media: 70 peat:30 perlite as a control, 70 peat:30 rice hulls, 50 peat:50 rice hulls, kenaf (100%) and 60 kenaf:20 peat:20 rice hulls. The seedlings' quality and the physical and chemical properties of the substrates were evaluated. After this, the seedlings were planted in the field and their field performance was recorded. The results showed that the growth medium 70 peat:30 rice hulls can successfully be used for the production of *P. halepensis*, since the seedlings' nursery and field performance were similar to, or even better than those obtained with the control medium. The seedlings produced in the growth media containing kenaf did not attain a suitable planting size and showed poorer field performance than control seedlings.

Keywords: Pinus halepensis; Substrate; Rice hulls; Kenaf; Peat; Growth; Field performance

1. Introduction

The three major functions of a growing medium for plants are to provide support, to retain water and nutrients and to allow oxygen diffusion to the roots. Although there is not an ideal growth medium suitable for all growing potted plants, a growth medium should incorporate both physical, chemical and biological requirements for good plant growth together with those requirements of practical plant production (to be readily available, easy to handle, lightweight and to produce uniform plant growth) (Landis et al., 1990; Heiskanen, 1993; Reinikainen, 1993).

A potting medium rarely contains a single ingredient, often being composed of two or more materials. Highly valuable materials such as soil, peat, sand, perlite and vermiculite are commonly used as substrates for container plant production (Tinus and McDonald, 1979; Landis et al., 1990). Nevertheless, these materials might be fully or partially replaced with various organic waste products such as rice hulls, kenaf, pine bark, etc., thus achieving environmental benefits since ecosystem damage caused by soil, peat, perlite and vermiculite extraction is avoided and the impact of residue accumulations is minimized. There are also economic benefits, because the use of residues means lower costs (Seilopoulos, 1995; Ingelmo et al., 1998; Webber et al., 1999; Abad et al., 2001). Rice hulls and ground kenaf core are not new to nursery production (Laiche et al., 1990; Howell et al., 1993; Dueitt et al., 1993; Kuczmarski, 1994; Wang, 1994; Webber et al., 1999; Tsakaldimi, 2002).

Kenaf (*Hibiscus cannabinus* L.) is a highly productive, warm-season, annual, renewable crop. Kenaf stem

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