



Vermicompost as potting amendment for the growth of different progenies of pine seedlings (*Pinus pinaster*)

Cristina Lazcano¹, Luis Sampedro², Rafael Zas², Jorge Domínguez¹

1. Departamento de Ecología y Biología Animal. Facultad de Biología. Campus Lagoas-Marcosende. Universidad de Vigo. E-36310 Vigo. Spain; E-Mail cristina@uvigo.es

2. Centro de Información e Investigación Ambiental de Lourizán, Apdo 127, Pontevedra 36080, Spain

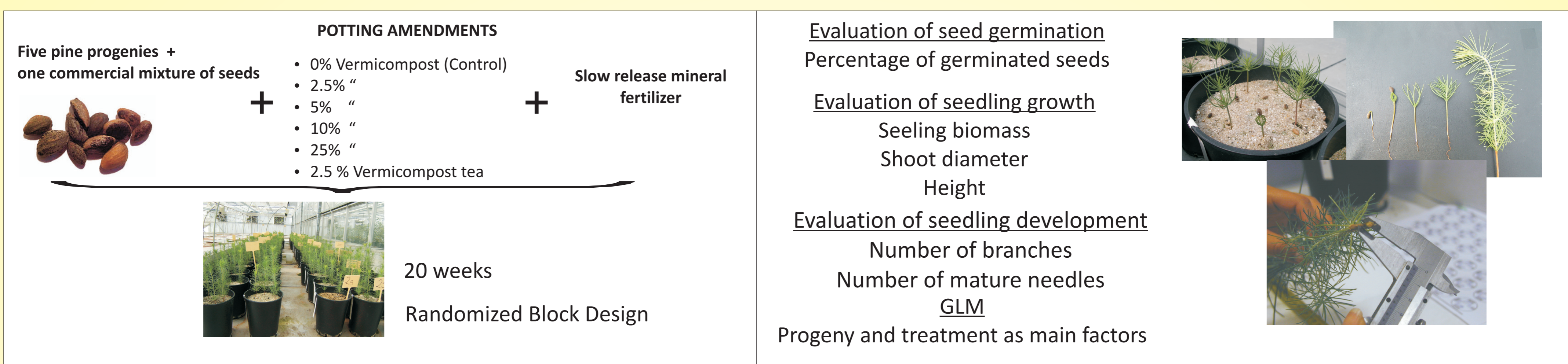
Conventional forestry breeding entails the use of big amounts of mineral fertilizers and peat. Environmentally-friendly alternatives contemplate the incorporation of organic fertilizers as a partial substitution of peat, and substitute of the expensive mineral fertilizers.



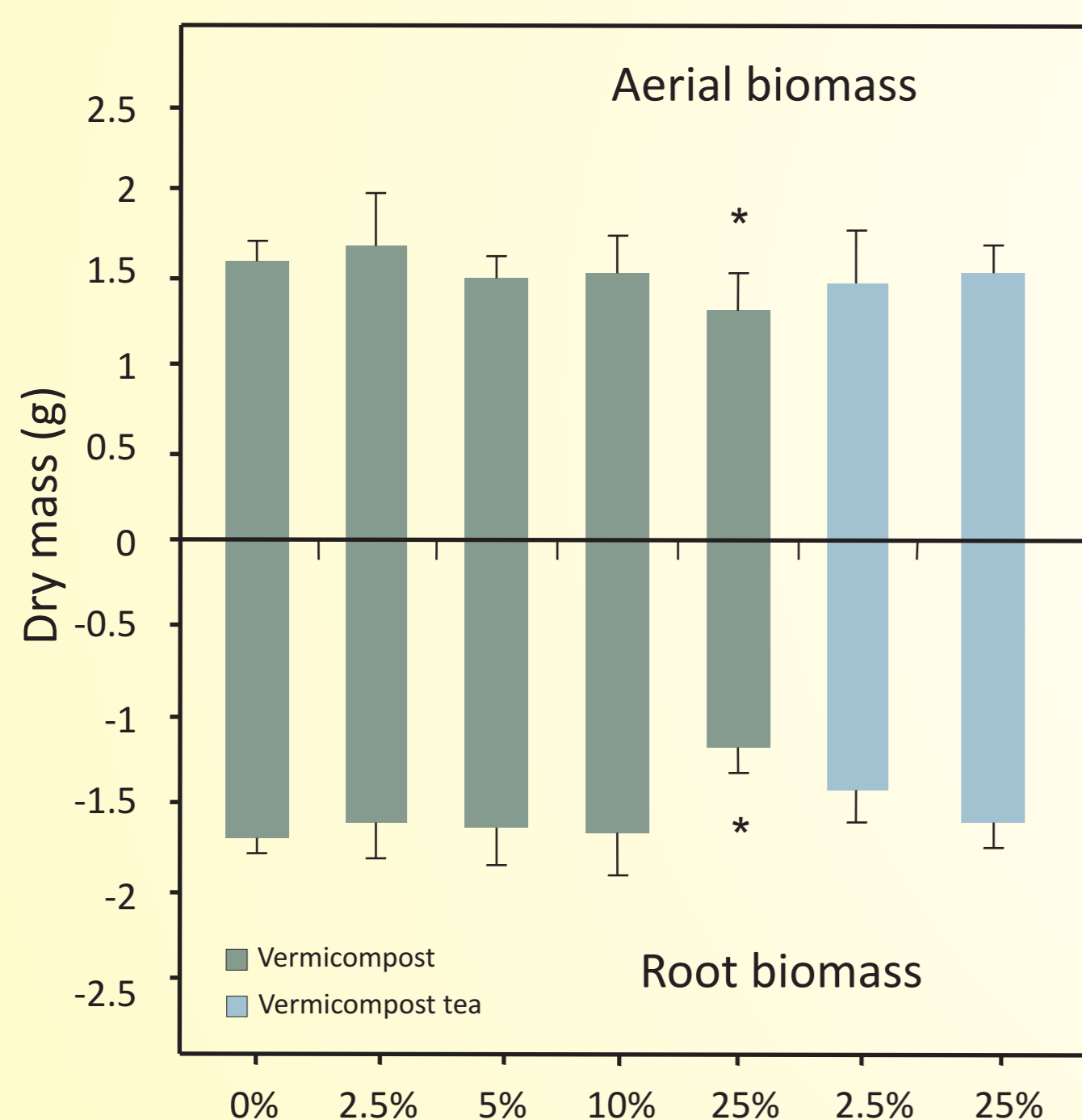
Vermicompost constitutes a slow release source of nutrients that provides the plants with the nutrients when they are needed; in addition, several studies have shown that vermicompost enhances plant growth independently of nutrients and, biologically active metabolites such as plant growth regulators and humates have been discovered in vermicomposted materials.

⇒ The effects of vermicompost have been described mainly on horticultural and ornamental plants and to a lower extent in forestry species. In addition, contradictory results are found in the literature concerning vermicompost effects on plant growth which might depend to a great extent on the plant species assayed. Besides, vermicompost effects might vary between genotypes of the same species.

⇒ **Does vermicompost enhance the growth of pine seedlings due to non nutrient-mediated mechanisms?**
 ⇒ **Is this effect genotype-dependent?**



Pine growth



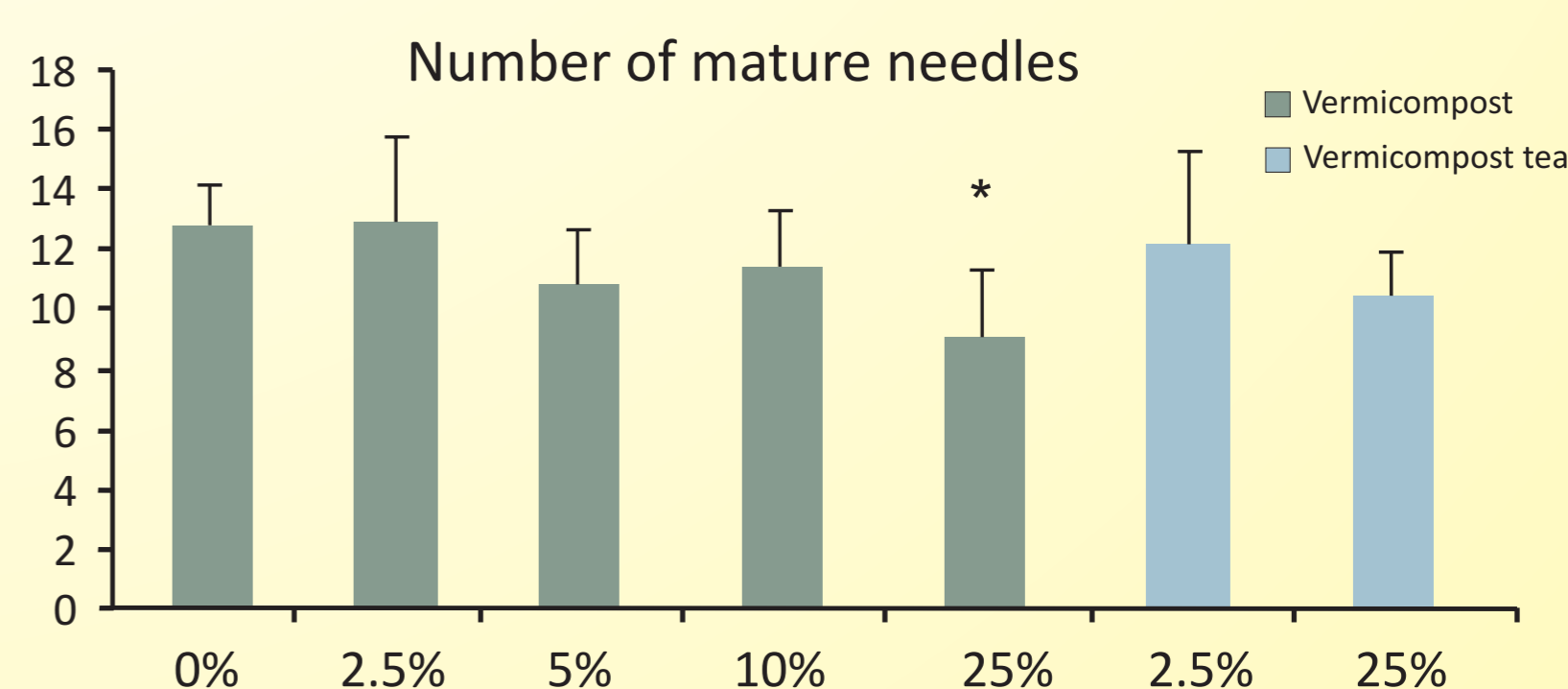
Decreases in aerial biomass were due to significant reductions in needle biomass ($P < 0.05$), diameter ($P < 0.01$) and height ($P < 0.01$) of the shoot in seedlings with 25% of peat substitution. All these effects were independent of seedling genotype except for the plant height where the different progenies responded differently to the treatments.

Aerial and root biomass of the pine seedlings were significantly influenced by the treatments applied in the potting medium ($P < 0.05$). Whilst the lowest doses resulted in similar yields than the control (0% substitution), substitutions of 25% of the peat by solid vermicompost produced significant reductions of shoot and root biomass independently of plant genotype.

Reductions in root biomass were attributable to the decrease in the abundance of fine roots ($P < 0.05$) while thick roots were unaffected.

Pine maturation

The substitution of peat by vermicompost influenced as well the early ontogenic development of the seedlings as showed by the number of mature needles ($P < 0.05$). This effect was also independent of plant genotype. Nevertheless the number of branches was not affected by the treatment.



Opposite to previous findings, in our study the substitution of peat by vermicompost did not produce any further beneficial effects in seedling growth and maturing as compared to peat with mineral fertilizer alone. Moreover, the highest dose of solid vermicompost produced significant decreases in seedling biomass. Generally all the progenies responded similarly to the treatments showing the strength of the effect.

In order to incorporate environmentally-friendly practices into pine seedling nursery, vermicompost can be introduced successfully in pine seedling growing media at low doses without detrimentally affecting plant growth. Higher doses could affect seedling growth influencing future field performance.