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Variation in biomass related variables of reed canary grass

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Abstract

Reed canary grass, *Phalaris arundinacea* L., is a relatively new biomass crop in northern Europe, which produces raw material for bioenergy and paper pulp. Breeding reed canary grass for industrial purposes is under way in the absence of domestic cultivars being available. Knowledge of the extent of variation in biomass related traits is a basic requirement for a breeding programme. The aim of this study was to describe variation in biomass related traits and evaluate the relationships among the variables. Field experiment was carried out in 1998 in Finland. Research material included wild and elite populations, which were divided into ten groups according to their origin. Biomass yield, plant fractions, shoot number, leaf area and overwintering ability were measured. Panicle number, plant height and seed ripening were included to the analyses of the relationships. Results indicate a high biomass yield potential of reed canary grass, reaching over 13 t DM ha⁻¹ in the fourth year after establishment. Elite material and a local group from southern Finland had the highest yield, whereas the northernmost local group had the lowest. Three factors established accounted for 45% of the variance and they were defined as "high biomass yield", "strong relationship" and "fast development". The first factor indicated positive connections among biomass yield, panicle number, plant height, straw fraction and node fraction. This study provides information on the variation in agronomic traits of reed canary grass, which enables breeding of new cultivars with desired trait combinations.

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