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Preliminary research on root characteristics of some turfgrasses in Kunming

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Key words : turfgrass , variety , root features , root activity , Kunming area

Introduction Roots represent the belowground component of vascular plants and are one of the most important plant organs responding to changes in growth conditions . The growth of the root system is genetically determined . The objective of this research was to examine the dynamic variation of turfgrass root system , select turfgrasses that have good performance of overwintering and integrated characteristics , and make some recommendations for turf greening in Kunming and similar areas .

Materials and methods A field experiment was conducted in Kunming area . The soil of the plot was red soil which has a soil pH value of 5.7 . The experiment used a randomized block design with 3 replications , the plot size was 1.0 m×1.0 m , sown with a single variety . Materials tested include a range of turfgrass species and their varieties , they are Watchdog , Pixie , Athena , Coronado , Firephoenix and Red Elephant of the Tall Fescue (*F . arundinacea*) ;Asap and Pickwick of the Perennial Ryegrass (*L . perenne*) ; Merit , Bluemoon , Juguar , Kentucky , Nuglade , Liberator and Bluechip of the Kentucky Bluegrass (*P . pratensis*) ; and Putter of the Creeping Bentgrass (*A . stolonifera*) . Samples were taken to determine yield of biomass , activity of root , the number of root and root hair .

Results The dynamic changes of root biomass of all turfgrasse species can be divided into four periods : (1) increase generally before winter ; (2) grow slowly or stop growing in winter ; (3) increase again during turning green period ; and (4) stabilize relatively after turning green period (Figure 1) . The root biomass of varieties with significant differences were Coronado , Athena , Pickwick , Liberator , Watchdog , Asap , Kentucky , Bluechip , Firephoenix , Juguar , Pixie and *C . dactylon* . The root activity of all turfgrasses were low , with no significant difference detected (Figure 2) . Majority of turfgrasses had good performances in that the number of roots and root hairs were more than 20 except Pickwick , Watchdog , Red Elephant , Pixie , or Juguar .

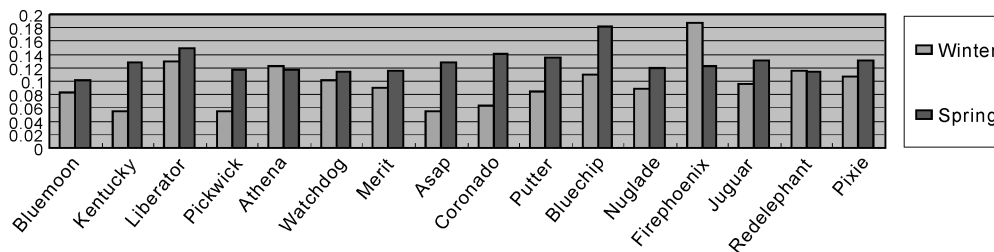


Figure 1 The root biomass dynamic of turfgrasses (g/m^2) .

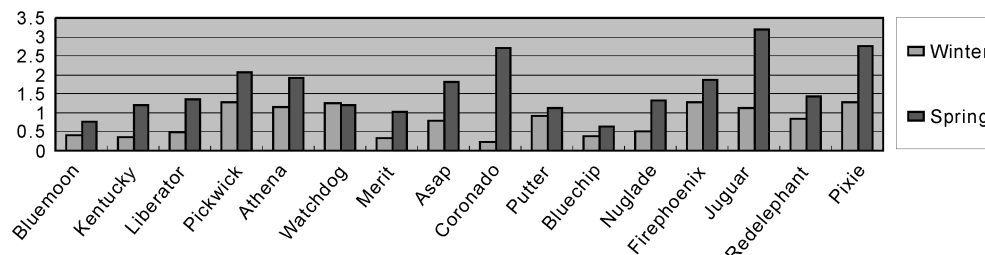


Figure 2 The root system activity dynamic of the main turfgrasses ($m^2 / plant$) .

Conclusions Varieties of turfgrasses such as Athena , Pixie , Red Elephant , Firephoenix , Pickwick , Bluemoon possessing desirable root characteristics can be used as slope-protected grass .

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