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Analysis of root morphological variation of different alfalfa cultivars

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Introduction Alfalfa root and crown are important organs for nutrition and water absorption , transportation . Crown also can form buds , which develop into stem and branch . Alfalfa root and crown are directly related with alfalfa yield and sustainable utilization , such as : regrowth , cold tolerance , drought tolerance and resistance to diseases and insect pests .

Materials and methods Thirteen alfalfa cultivars ,obtained from Grassland Research Institute of Academy of Agricultural Science . The material seeds were sowed in June and measured the root morphology in September and October 2007 , . data analysis using Marquez-Ortiz^a and Johnson's method .

Results and discussion The contribution rate from crown diameter is 46 .4190% , which is the main variation resource , the next is tap root diameter and tap root length , contribution rate is 20 .9041% and 17 .9611% respectively . The eigenvalues of the last three principal components are very small , less than 1(Table 1) .

Table 1 The principal component analysis of index in root system .

Indexes	Eigenvalue	contribution rate%	Cumulative contribution rate %
Crown diameter	2 .7851	46 .4190	46 .4190
Tap root diameter	1 .2542	20 .9041	67 .3231
Tap root length	1 .0777	17 .9611	85 .2842
Lateralroot diameter	0 .5201	8 .6685	93 .9527
Lateral root position	0 .2486	4 .1438	98 .0965
Lateral root number	0 .1142	1 .9035	100

Conclusion Alfalfa root system morphology main variation comes from crown diameter , tap root diameter , tap root length .

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References

- Marquez-Ortiz J . J . , Johnson L D , Basigalup D H , Barnes D K . (1996) . Crown morphology relationships among alfalfa plant introduction and cultivars . *Crop Science* ,36 ,766-770 .
- Johnson L D , Marquez J . J . , Lamb , J . F . S . , *et al* . (1998) . Root morphology of alfalfa plant introductions and cultivars . *Crop Science* ,38 ,497-502 .