Dynamics change of Water-Soluble Carbohydrate contents in roots system during greening stage of *Leymus chinensis* populations in Saline-Alkaline Soil on the Songnen Plains of China

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Introduction Water-soluble carbohydrate(WSC) plays an important role in metabolism of the plant . It is reported that it is indispensable for plants to turn green and to endure stresses . In spring , the growth of plants strongly depends on the reserves accumulated during the previous seasons . In late April , *Leymus chinensis* began to turn green , during the process , a considerable amount of WSC from its roots system (including rhizomes , tilling nodes and adventitious roots) must be consumed to growth . The dynamics change of WSC contents in roots system can be used as an indicator of its growth .

Materials and methods The experiment was conducted in a large area with single dominant *L . chinensis* populations in saline-alkaline soil in Daqing city , in Heilongjiang province (125°09′E ,46°35′N) . The chemical characteristics of the saline-alkaline soils have been measured first (Figure 1) . During late April and Mid-May(no rainy days) , A sampling every 3 days ,excavated up to a depth of 0 .2m below the ground in the same area($25\times25cm^2$) .Contents of WSC were determined quantitatively using the colorimetric anthrone method . Each sample was tested three times . The WSC content was obtained using the flowing formula : $C=(SC\cdot SV\cdot DSR/SM\cdot 10^{-3})\times100\%$,where *C* is the content (%) , *SC* is the sample concentration (mg/L) , *SV* is the solution volume (mL) , *SDR* is sample dilution ratio , and *SM* is sample mass (mg) .

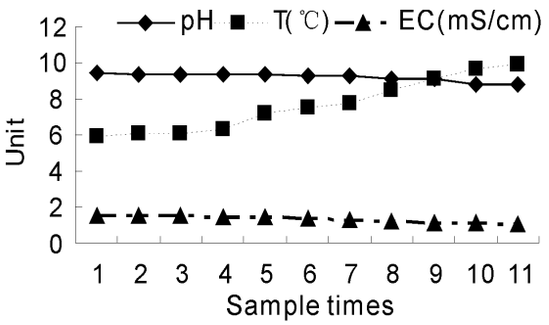

Figure 1 *The chemical characteristics of the saline-alkaline soils (0-20cm) .*

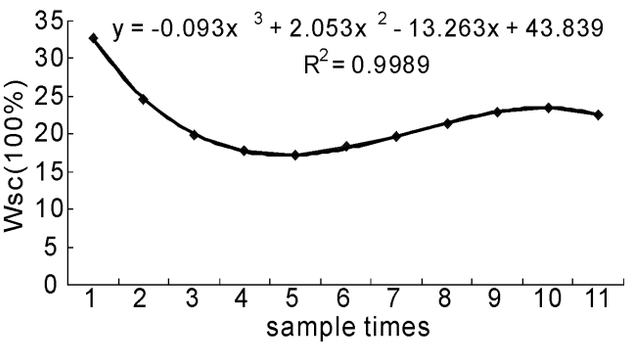

Figure 2 *Dynamic change of water-soluble carbohydrate contents in roots of L .chinesis .*

Results WSC contents in roots system of *L . chinensis* significantly decreased at first , then slowly to increase from germination period to greening growth(Figure 2) ,The trend of changes in WSC contents shows the regression equations : $y=-0.093x^3+2.053x^2-13.263x+43.839$ ($R^2=9989$) .

Conclusions From germination period to greening stage , abundant stored matter was consumed . WSC stored were continuously supplied to the aboveground for growth . So the contents significantly decreased . With the growth of plants , the species can get certain photosynthetic products which prevent WSC from continuing to decrease , but weaken to store and almost balance between growth and decline . Besides in response to initial growth , the contents of WSC still need to resist the adverse conditions , such as low soil temperature , high pH and salty stress . The experiment confirmed that the *L . chinensis* population environmental adaptability and can improve the Saline-Alkaline soil .

References

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