

Analysis and comprehensive evaluation of lodging resistance of different wheat varieties

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Abstract: **【Objective】** In order to comprehensively evaluate the lodging resistance of different wheat materials at different growth stages and clarify the key factors affecting wheat lodging. **【Method】** 274 wheat varieties mainly from Huanghuai wheat area and northern winter wheat area in China and some foreign introduced varieties were used as materials. Sixteen lodging-related traits were measured at flowering stage, filling stage and milk ripening stage, and the lodging resistance of these wheat materials was comprehensively evaluated by description, principal component analysis and cluster analysis. **【Result】** The results showed that there were significant variations in 16 lodging-related traits among different genotypes and during the growth period. At different growth stages, the correlation between traits was basically the same, which showed that the thickness of basal stem wall, plumpness, stem diameter and stem strength had a positive effect on the lodging resistance of wheat, while plant height, height of center of gravity, length of basal stem node and stem under spike had a negative effect. Principal component analysis showed that stem strength was the most critical trait affecting plant lodging resistance. **【Conclusion】** Cluster analysis based on the comprehensive factor scores of the principal components at three growth stages showed that 13 materials had excellent comprehensive lodging resistance and 84 materials had excellent comprehensive lodging resistance. Some of the wheat materials had excellent lodging resistance and could be used as breeding resources for strong stalk lodging resistance of wheat.