Quantitative Analysis of Alfalfa F_1 from Different Hybrid Methods

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Quantitative analysis of alfalfa F_1 from different hybrid methods

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Introduction Alfalfa (*Medicago sativa*) is an excellent forage , in which heterosis is affected by several factors including hybridization methods . This study focused on analyzing the quantitative characters average heterosis of F_1 generated from different hybridized combinations between Acrora ,13R Supreme (GT13R) ,Archer Ⅱ ,AC-3 and Deqin alfalfa .

Materials and methods Implement obverse and inverse cross between Alfalfa in Deqin (Deqin in short) and other introduced cultivars respectively , Deqin was female parent in obverse cross and male parent in inverse one . First to measure 14 quantitative characters(QC in shot)3 in yield :leaf(A) ,stem (B) and total(C) ;9 in growth potential : branches number (D) , stem diameter (E) , absolute height(F) , natural height(G) , longest stem's average internode length(H) ,node number(I) , leaf number(J) , longest lateral branch length (K) and branches number (L) ; 2 physiological characters :net photosynthetic rate (M) and transpiration rate(N) of all parents and their F_1 ,then to calculate and compare average heterosis (Yun ,J .F . ,2000) of these characters for different F_1 . If more than 4 out of 9 determining growth potential characters' average heterosis are positive (negative) in one group , namely define that of the combination is positive(negative) .

Results and discussion Significant difference exists in yield characters' average heterosis of all F_1 especially of GT13R combinations , as positive heterosis is remarkable of F_1 from obverse cross while from inverse is worst ; Negative heterosis is shown by F_1 of ♂Acrora×♀Deqin , the other is opposite ; Both F_1 from Archer Ⅱ combinations show positive heterosis and from AC-3 combinations perform excellently however the inverse one is better . For average heterosis of physiological characters , the same tend as of yield ones appears in F_1 from GT13R and Acrora combinations respectively ; F_1 from Archer Ⅱ combinations perform no significant difference ; Negative heterosis was get from ♂AC-3×♀Deqin and if inverse , positive in M and negative in N emerged .

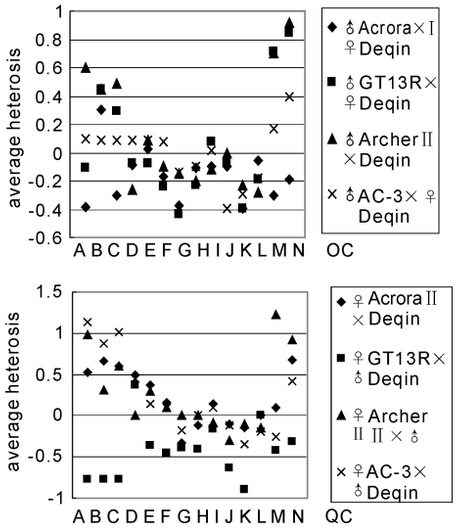

Figure 1 *Quantitative Characters Average Heterosis in F_1 from Obverse Cross(I) & Inverse Cross (II)*

Conclusions It is clear yield , growth potential and physiological characters of F_1 are various resulted from different hybrid methods , that means characters especially in yield presented by F_1 from different combinations are influenced by cytoplasm at different level . GT13R and Acrora combinations are influenced obviously yet only yield character in Ac-3 combinations is significantly influenced ; in Archer Ⅱ ones non influence appears nearly . Therefore , quantitative characters of F_1 are influenced by hybrid methods , the extent of this influence rests on genotype of parents .

Reference

Yun ,J .F . ,2000 . Forage and Feed Crops Breeding Science . BeiJing : *China Agriculture Publishing House* , . 69-70 .