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Study on hybrid selective breeding of high quality variety— *Medicago sativa* L . cv . Xinduo

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Key words : *Medicago sativa* L . , cross breeding

Introduction *Medicago sativa* L . cv . Xinduo is a high quality of hybrid *Medicago* strain , which is hybrid from *M . sativa* L . cv . Sandeli (introduced from Canada) and *M . sativa* L . cv . Beijiang (local species) . Crossbreeding is one of the best efficiency ways to increase new forage variety resources by means of gene recombination . To produce new alfalfa varieties with the characteristics of high quality , high yield and strong resistance , we use the traditional crossbreeding way to select good performance plants , harvest the seed separately , and then sow in plots , to transfer cold resistance and other good characteristics from *M . sativa* L . cv . Beijiang to *M . sativa* L . cv . Sandeli . With continuous 5 years primary election , re-selection , qualitative selection , growth and development characteristic observation and yield test for the crossbreed variety of *Medicago sativa* L . cv . Xinduo , we found its botanic characteristics are large and plump foliage , erect and no-lodge soft stalk with white and purple color , and the ratio of foliage to stalk is 1 : 1 . The biologic characters are : strong drought and cold resistance and tolerance , early turn to green in the beginning of spring , growth gloom in summer , anti-disease and insect pests , fast re-vegetation . With proper irrigation can supply second harvest . Can be harvested three times a year and produce 12000-15000 kg/ha of hay . It is one of high quality of crossbreed alfalfa varieties (strain) which is worth while to sow in irrigated agricultural area of Xinjiang .

Materials & methods We used *M . sativa* L . cv . Beijiang and *M . sativa* L . cv . Sandeli as trial material , with the method of group mixture sowing , single plant selection and breeding and apian pollination . With 3 different row spacing (30 cm , 45 cm , 60 cm) , and 5 alfalfa varieties (*M . sativa* L . cv . Sitel , *M . sativa* L . cv . ureka , *M . sativa* L . cv . Derby , *M . sativa* L . cv . Alfa Queen and *M . sativa* L . cv . Xinduo) we did the varieties comparison test . The test field is located in jiuyunjie township and zinquanzi township of Xinjiang Fukang City . The test trial plots were randomly arranged , with 3 replications . The area of trial plot was 2.5 × 4 m . The growing stage , growth speed , re-growth , stalk to foliage ratio , fresh to hay ratio , leaf number percentage and yield were evaluated .

Results & discussion The test results show that crossbreed variety of *M . sativa* L . cv . Xinduo has the following characteristics : leaf number percentage is 26% , higher than the other 4 varieties , strong cold and drought resistance and tolerance , fast growing speed and good regrowth . The average growing speed of *M . sativa* L . cv . Sitel and *M . sativa* L . cv . Derby are slower . The regrowth speed for *M . sativa* L . cv . Alfa Queen and *M . sativa* L . cv . Ureka during second and third harvesting time are faster than others .

Conclusions The characters of growing speed , regrowth , resistance ability and yield , etc , all were improved as compared to other test varieties . Also , overcame the cold winter with stable snow on North slope of Tianshan mountain , in Xinjiang . It is a good crossbreed variety and worthwhile to extend in Xinjiang .

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