Optimal Harvest Time for *Medicago ruthenica* Seed

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Key words: *Medicago ruthenica*, optimal harvest time, flowering, seed quality, seed yield

Introduction *Medicago ruthenica* is an excellent perennial legume and widely distributed. The biggest problem limiting its development and application is seed production due to excessive seed shedding. It is a pivotal factor limiting seeds quantity and quality. So it is essential to determine the optimal harvest time to balance the seed loss and seed gain with high seed quality. Accumulation of degree-days has been used to determine optimum harvest time (Edwards, 1980). The objective of this study was to determine the optimal harvest time of *M. ruthenica* seed in northern China.

Materials and methods The study was carried out at the Ecosystem Field Station at Songnen Grassland (44°40′N 123°44′E, 167m a.s.l.) in northern China in 2006. It is in a semi-arid area and has aeolian sandy soil with pH 8.45. The plants were grown in 2002 and the branch density in 2006 was 127/m^2. When the yellow pod appeared, pods were harvested from four quadrats (0.3 m^2) every 3 days until the majority of pods were brown. The pods were hand threshed for seeds after air-dried for 1 month. The percentage germination (PG), hard seed percentage (HSP) and 1000 seeds weight (TSW) were tested. Growing degree days (GDD, Tb=0℃) for each day were calculated using the equation: GDD = Tm-Tb. Statistical analysis was performed using the SPSS. Treatment means were compared by LSD at the 5% level of significance.

Results The maximum seed number occurred on 30 days after initial anthesis (DAIA) but the difference between 30, 54 and 57 DAIA were not significant (Figure 1). The maximum available seed number and seed weight are both on 57 DAIA (Figure 2). PG, HSP and TSW had a significant linear relationship with days after initial anthesis (Figure 3).

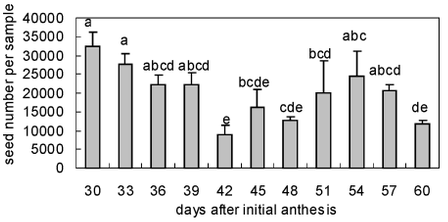

Figure 1 *Trends of total seed number.*

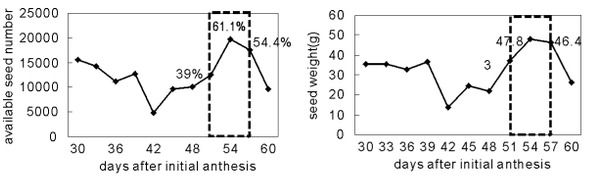

Figure 2 *Trends of viable seed number and seed weight.*

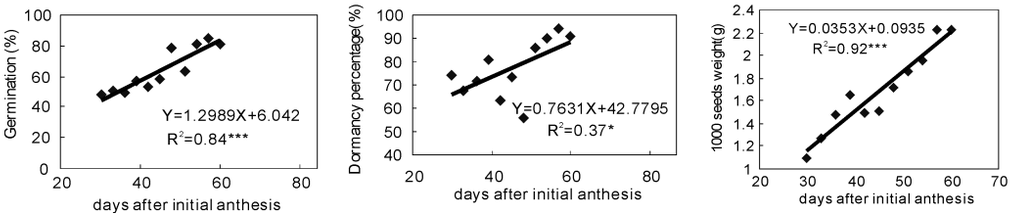

Figure 3 *Regression of percentage germination, hard seed percentage and* 1000 *seeds weight on DAIA.*

Conclusion The optimal harvest time of *M. ruthenica* growing on Songnen Grassland in northern China is 51-57 days after initial anthesis and the GDD is 1003-1131.

Reference

Edwards, D.G.W., (1980). Maturity and quality of tree seeds—a state-of-the-art review. *Seed Sci. Technol.* 8, 625-657.