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The use of birdsfoot trefoil, Lotus corniculatus L., is restricted in part by the high cost of seed. Seed harvests are difficult because the seed pods dehisce at maturity and expel the seeds in all directions. A single plant of L. japonicus Regel was observed in Japan which possessed intact seed pods. Seeds were harvested from this plant and from a surrounding plant which exhibited the typical dehiscent habit. L. japonicus is a diploid species closely related to the natural tetraploid L. corniculatus. At Purdue, seed pods from the "shattering" and "nonshattering" strains were placed in desiccators at 3 relative humidities. After 72 hrs, at 29.5 RH, 85.4 and 63.0% of the shattering and nonshattering strain pods, respectively, had dehisced. 39 nonshattering and 10 shattering plants were placed in a controlled climate chamber at 80 F, 30% RH. Variation among plants of the nonshattering strain ranged from 89.5 to 8.3% shattering. This large variation among plants maintained under uniform environmental conditions indicated a significant genotypic influence. This variation among progeny of a single plant indicated that although L. japonicus is self-fertile under greenhouse conditions, cross pollination may occur in natural populations. Pods from plants exhibiting high and low dehiscence were sectioned, stained, and examined microscopically. Pods with high dehiscence exhibited a solid layer of sclerenchyma cells in the mesocarp. In the low dehiscent pods this layer of sclerenchyma was replaced by a loose, disconnected layer of fibrous cells surrounded by parenchyma.