Inheritance of Seed Dehiscence in a Cross Between *Avena byzantina*
C. Koch and *Avena fatua* L.

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*Avena fatua* L. (Wild oat) is a vigorous weed in the southwestern United States. It is the most serious weed pest in winter-grown small grain crops. Preliminary observations suggested the possibility of crossing *Avena byzantina* C. Koch (Red oat) × *Avena fatua* L. (Wild oat) and developing a high yielding oat for forage and grain. A commercial oat has been developed from a wild strain by C. A. Suneson of the USDA Agricultural Research Service in cooperation with the California Agricultural Experiment Station (7). One serious objection to the use of *Avena fatua* in an oat breeding program is that a number of plants dehisce their seeds at the onset of maturity (Figure 1). Commercial varieties of *Avena byzantina* do not dehisce their seeds in this manner. The objective of this study was to determine the inheritance of seed dehiscence in a cross between *Avena byzantina* × *A. fatua*.

**REVIEW OF LITERATURE**

The shape of the base of the primary floret and the manner in which it separates from its pedicel are differentiating features of oat species and varieties (6). The "wild" type of base found in *A. fatua* has a deep, oval cavity and the separation of the kernel is by abscission, leaving a clean basal scar. This type of oat shatters easily. In contrast, the "cultivated" type of base found in *A. sativa* is solid and separation of the kernel is by actual fracture. "Cultivated" oats are more resistant to shattering. Variability in the expression of kernel base type has been observed in *A. byzantina* (2). In crosses between *A. byzantina* and *A. sativa*, Hayes et al. (5) found the *A. sativa* base type to be dominant in the *F*₁ and noted that the *F*₂ gave a ratio of 3 *A. sativa*:1 *A. byzantina* base types.

Aamodt et al. (1) crossed *A. sativa* with *A. fatua* and reported that the *F*₁ resembled *A. sativa* more than *A. fatua* and was nonshattering like *A. sativa*. In the *F*₂, the authors found it difficult to distinguish between the *A. sativa* type and the intermediate heterozygote. However, if these two groups were combined, a 3:1 ratio was obtained.