

The Role of Disease Resistance in Enhancing Stand Persistence in Alfalfa Cultivars Released from the 1940s Through the 1990s

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Over the past six decades alfalfa breeders have made substantial efforts to incorporate desirable agronomic traits into new alfalfa cultivars. Improvements in yield, forage quality, and resistance to diseases and insect pests have been in the forefront of this breeding effort. However, some studies have suggested that limited progress has been made in improving alfalfa yield and persistence, regardless of improvements in disease resistance (Wiersma, 1997; Volenec, et al., 2002).

A four-year field trial, seeded in Spring, 1999, at Columbus, OH, compared yield, percent ground cover, and incidence and severity of several diseases among sixteen alfalfa cultivars. This trial was part of a larger project which was initially replicated in five mid-western states (Lamb, et al., 2002). Entries were selected to include two of the top-yielding cultivars by decade from the 1950s through the 1990s. Additional cultivars were included as checks. In Spring 2004, percent ground cover was less in stands of cultivars with older release dates than stands of modern cultivars. As expected, more plants affected by Fusarium wilt (*Fusarium oxysporum* f. sp. *medicaginis*) and anthracnose (*Colletotrichum trifolii*) were present in cultivars with lower reported resistance levels. In general, these cultivars had earlier (older) release dates. There were highly significant negative correlations between Fusarium wilt incidence and both yield and percent ground cover. Anthracnose incidence also showed a significant negative correlation with yield and with percent ground cover. There were no significant correlations between percent ground cover and spring black stem, summer black stem, Rhizoctonia stem blight or Sclerotinia crown and stem rot. While increased resistance to the major alfalfa diseases may not account wholly for increased yield and persistence, disease incidence data from Ohio suggest that resistance to specific diseases enhances stand persistence and yield.

References:

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