Hybrid verses synthetic alfalfa forage yields in small plots compared to on-farm strip trials.

Michael Velde, Derry Abraham, and Steve Wagner
Dairyland Research, Clinton, WI 53525

In the corn hybrid industry, the advanced stage of the evaluation of new varieties has gradually moved from small replicated plots to on-farm strip trial testing. Small replicated plots have the advantage of balanced and replicated data, but are generally limited in terms of testing environments and are criticized for not representing normal on-farm field conditions. Strip plots, on the other hand, generate highly unbalanced and non-replicated data. They are less controlled, but sample more environments, and, in the corn industry, are generally more representative of on-farm performance. Similar experience in testing alfalfa varieties is lacking. To coincide with the commercial launch of hybrid alfalfa in March, 2001, alfalfa strip trials were established across the Midwest. The objectives of this study were the following: 1. to compare hybrid versus synthetic alfalfa forage yield in replicated small plots; 2. to compare hybrid versus synthetic alfalfa forage yield in on-farm strip trials; 3. to compare hybrid versus synthetic alfalfa forage quality in on-farm strip trials.

On-farm strip trial testing was conducted by 27 farmers across 6 states. Strip trials were planted in 2001, 2002 and 2003 using normal farmer cultural practices. Plots were harvested in 2002 and 2003 and forage quality samples sampled and analyzed for each variety. Replicated small plot data was collected from 83 university trials across 20 states. The data analysis included all of the head-to-head data for the hybrid versus the 26 varieties that were tested in both on-farm strip trials and in replicated small plots. Individual head-to-head hybrid versus synthetic comparisons are presented for the 10 synthetics that were tested in at least 4 on-farm strip trials.

In on-farm strip trials, the hybrid had a significant yield advantage versus 7 out of 10 varieties (p-value < 0.05), and the average hybrid forage yield advantage over synthetic varieties was 22.6% (p-value < 0.001). In replicated small plots, the hybrid had a significant yield advantage versus 2 out of 10 varieties (p-value < 0.05), and the average hybrid forage yield advantage over synthetic varieties was 3.2% (p-value < 0.001). The hybrid on-farm advantage is significantly greater than the hybrid small plot advantage (p-value < 0.001), and the correlation between them is 0.35. On-farm milk per acre hybrid advantage versus synthetics was 18.5% (p-value < 0.05). Significant 9 of 10 varieties. On-farm relative feed value hybrid advantage versus synthetics was -1.5%. Not significant for any comparisons. On-farm dry matter: hybrid was 3.8% drier than other synthetics (p-value < 0.05).

In summary, the hybrid forage yield advantage was large and significant on-farm. Relative feed value comparisons on-farm was not significant. The hybrid milk/acre advantage was large and significant on-farm. The hybrid forage yield advantage in small plots was significant but not as great as on-farm. Corn data indicates that small plot data does not always predict on-farm performance. Initial data in alfalfa indicates a similar trend. Like the trend in corn 20 years ago towards more on-farm strip testing, more strip trial testing is needed in alfalfa.

References:

Bradley, J.P., K.H. Knittle and A.F. Troyer. 1998 Statistical Methods in Seed Corn Product Selection. Journal of Production Agriculture Vol. 1, no. 1 1998.
Yan, W., L.A. Hunt, P. Johnson, G. Stewart, and X. Lu. 2002, On-Farm Strip Trials vs. Replicated Performance Trials for Cultivar Evaluation. Crop Sci. 42:385-392.