What can we learn from "old" alfalfa variety trials?

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In our hectic work mode, we seldom take time to look at historic variety testing data to see what they can tell us about long term trends. We pooled the data from Penn State's alfalfa variety trials from 1996 to 2011 and began asking general questions that the data might answer.

Question 1: Does it pay to use variety trail data when selecting an alfalfa variety?

Over the past 16 years, yield of the top 5 varieties has averaged 1.7 tons acre^{-1} more than the yield of the bottom five varieties (Fig. 1). To a producer making variety selections, this difference would amount to nearly \$340 acre^{-1} year^{-1} (assuming a hay value of \$200 ton^{-1}) more income by reviewing variety trial data and selecting a top variety.

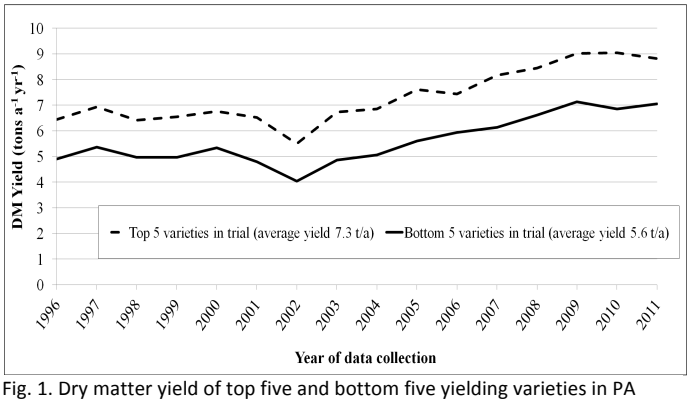

Fig. 1. Dry matter yield of top five and bottom five yielding varieties in PA trials. Values are the average of 40 locations/years of data.

Question 2: Has the yield potential of alfalfa varieties increased?

Alfalfa varieties being evaluated 10-15 years ago yielded 1.6 tons acre^{-1} less than current varieties (Fig. 2). This difference was present in all years of the stand life. Improved yields may be due to changes in management (fertility, pest control). However, it is likely that the majority of the improved yield is the result of improved variety genetics.

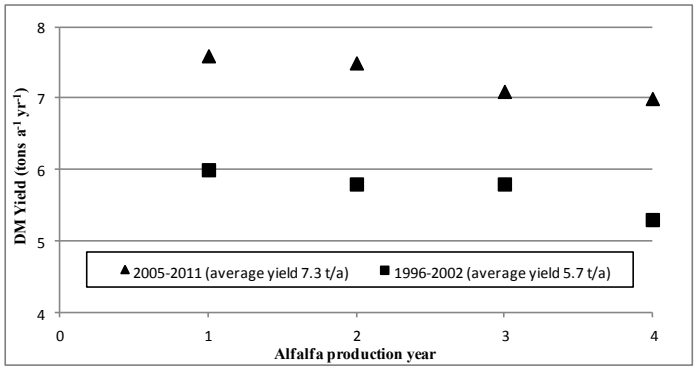

Fig. 2. Dry matter yield of older verses newer alfalfa varieties. Values are the average of 14 locations/years of data.

Question 3: In which year of production does alfalfa yield peak?

In our variety trials, alfalfa yield peaked during the first production year (year after spring seeding) and declined at 0.2 ton acre^{-1} year^{-1} thereafter (Fig. 3). At \$200 ton^{-1} for alfalfa hay, this yield decline translates into a \$40 acre^{-1} decline in profit each year after the first production year.

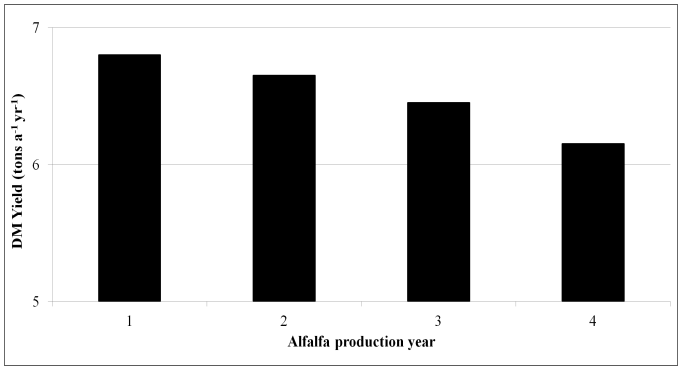

Fig. 3. Effect of stand age on alfalfa yield. Values are the average of 32 locations/years of data.