

Breeding better alfalfas for sustainable cropping systems in eastern Australia.

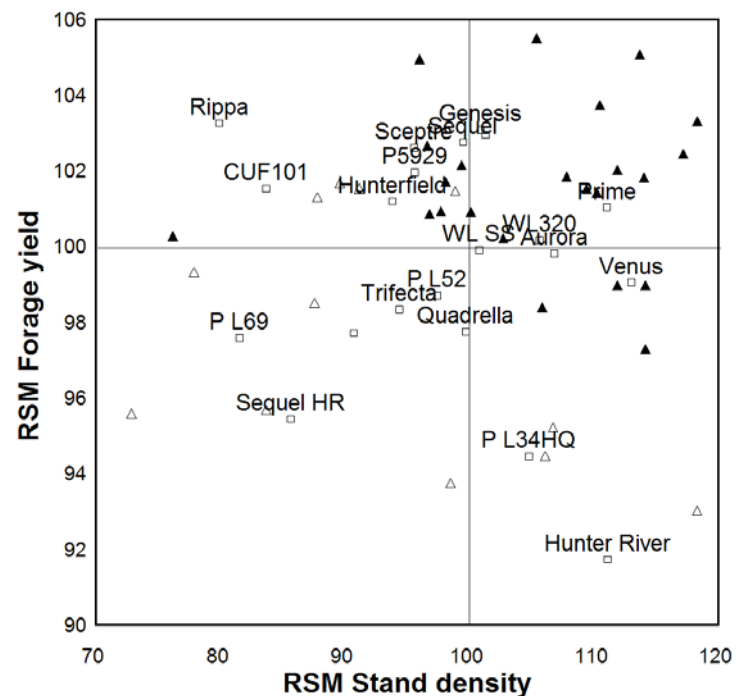
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Improved varieties will help increase the use of alfalfa in sustainable cropping systems throughout eastern Australia. To refine breeding objectives, the same set of 60 lines and cultivars were sown in 15 rainfed trials in New South Wales (NSW) and southern Queensland. There were 139 forage harvests across trials in three years. Stand density was measured annually using relative frequency counts. All trials were ungrazed. Major outcomes included:

- Alfalfa entries differed in their relative performance across sites. Unlike most existing varieties, NSW-bred lines generally combined high yields with good stand densities across these harsh environments (Fig. 1).
- As expected, the association between forage yield and winter-activity (or non-dormancy) was stronger in sites with longer growing seasons. However, the association was relatively weak across all trials.
- Persistent alfalfas were not necessarily low yielding, but tended to be those types with lower levels of winter-activity. Stands thinned sooner in sites with longer growing seasons.
- Increasing resistance to pests and diseases had no consistent benefit to alfalfa productivity or persistence across these trials. This suggests that the general adaptation of different alfalfas to rainfed conditions in these trials was more important in determining success than was their relative resistance to pests and diseases. It also suggests that pests and diseases were rare or posed only minor limitations to performance in these rainfed sites.

Elite selections from all trials have been combined in crosses and sown as breeding lines and progeny rows in new trials at key locations. Further cycles of selection and crossing will produce desirable new alfalfas for cropping systems that will be easier to establish, easier to manage and easier to remove than current varieties.



relative to overall site means (RSM) for NSW-bred lines (▲), current cultivars (□) and imported accessions (△) across 15 rainfed trials in eastern Australia.