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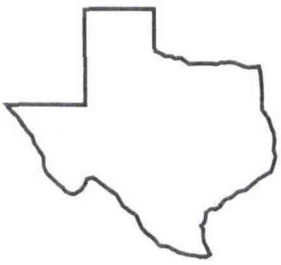
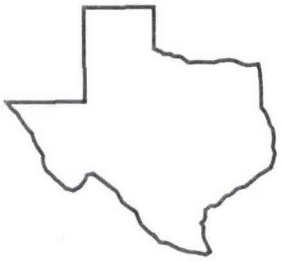
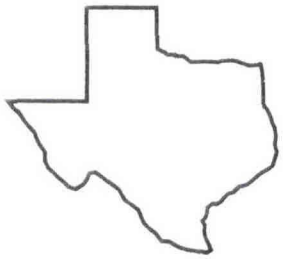
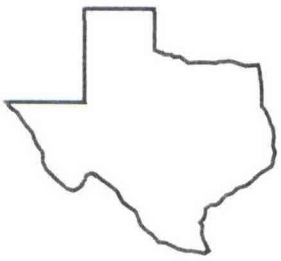




Overton Field Day Report - 1994





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EVALUATION OF ROSE CLOVER GERMPLASM FOR COLD TOLERANCE

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Background. Rose clover is a winter annual legume that is used for pasture and soil conservation plantings in California, Australia, and Texas. Cultivars of rose clover are available that vary widely in date of flowering and winter growth habit. Kondinin and Hykon rose clover flower early in comparison to Overton R18 when grown in East Texas. Overton R18 flowers in early May and matures seed by mid-June. However, Kondinin and Hykon are less winter-dormant and more productive than Overton R18 in late winter. Kondinin and Hykon are often damaged by cold temperatures and sometimes winterkill in northeast Texas. Overton R18 is more tolerant of cold temperatures than these early cultivars and has survived winters in central Oklahoma. Rose clover cultivars are needed with long-season (Nov. through May) forage production and cold tolerance to northeast Texas winters. An experiment was conducted to evaluate cold tolerance in selected field-grown rose clover germplasm.

Research Findings. Three rose clover cultivars, five rose clover experimental lines, and Dixie crimson clover were grown at a field site near Overton, Texas from Nov. 1992 through May 1993. Clover entries were main plots and seven sample dates were sub plots in a split plot design with 6 replications. Sample dates began on 9 Feb. 1993 and continued to 4 May at 2-week intervals. Leaf tissue was sampled and evaluated for freezing tolerance using an electrolyte leakage assay which included exposure to -14 ^{o}C for 60 min.

Freezing tolerance usually increases if plants are exposed to cold temperatures. This process is known as acclimation and the reverse process, or the decrease in freezing tolerance, is known as deacclimation. The clover entries exhibited different rates of deacclimation from 9 Feb. to 4 May (Fig. 1 and 2). The experimental lines TX-B97 and TX-B29 had the ability to respond rapidly to cold field conditions by reversing their deacclimation process. At the 9 Feb. sample date, Hykon and Kondinin were less acclimated ($p<0.05$) and showed less freezing stress tolerance than the other seven clover entries evaluated.

Application. Rose clover cultivars are different in their response to cold temperatures and in freezing tolerance. The early-maturing cultivars such as Kondinin and Hykon are not as cold tolerant in northeast Texas as Overton R18 rose clover or Dixie crimson clover. Experimental rose clover germplasm is available with cold tolerance equal to Overton R18.

Fig. 1. Interaction of cultivar and sample time for four rose clover cultivars in experiment ECF1.

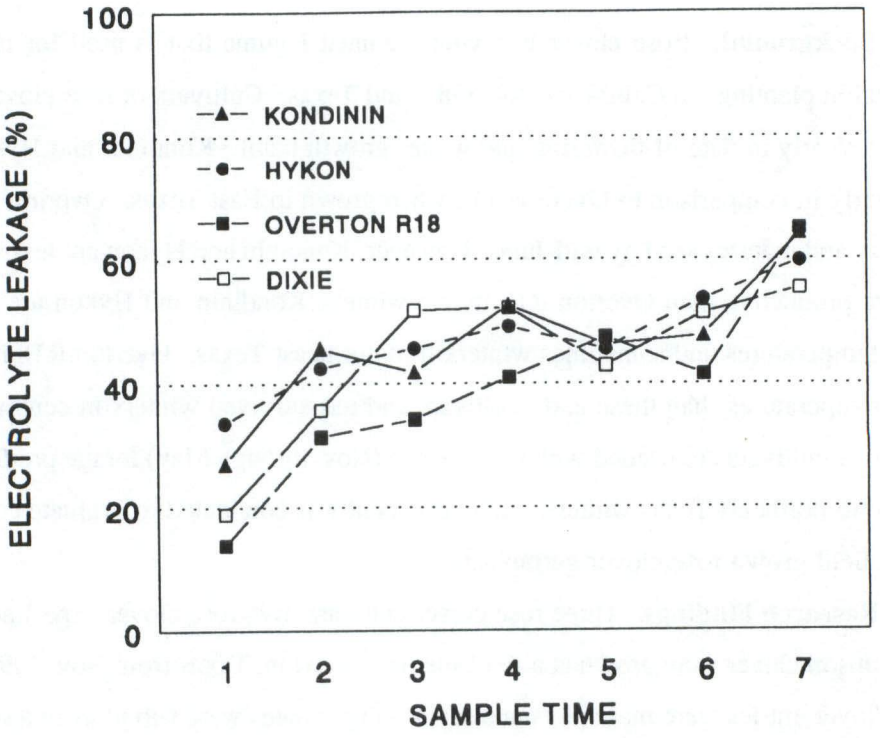

Fig. 2. Interaction of cultivar and sample time for five rose clover cultivars in experiment ECF1.