BROOM SNAKEWEED DISPERSAL AND GERMINATION

B. L. Wood and K. C. McDaniel

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Undesirable stands of broom snakeweed of various intensities are ubiquitous throughout New Mexico's blue grama rangelands. To efficiently and economically control this half-shrub, a more comprehensive database concerning its reproduction strategies needs to be developed.

Broom snakeweed dispersal characteristics were monitored by placing four seed traps (1m by 10 by 3.2 cm) around ten plants at the cardinal directions and by collecting achenes weekly or bi-weekly from late October 1993 through July 1994. Over 50% of achenes dispersed between October and December 1993. Relatively large amounts of seed were recovered after periods of intense southwest winter winds and after heavy May rains. Of the seed recovered, 78% were in the east tray and 86% were within 50 cm of the parent plant. Examination of both ray and disc florets revealed that only ray achenes routinely produce fertile embryos. The highest average number of achenes produced over twelve plants harvested bi-weekly was estimated at 3900 per plant. Viability of seeds from harvested plants were tested using tetrazolium salts at harvest and after three, six, and nine months lab and field storage. Viability of seeds collected in January and stored in the field within nylon packets until April averaged 82%. After May 17, 1994, viability of all but lab stored seed declined to less than 4%; lab stored seed did not differ significantly from seed tested at harvest over time.

Greenhouse experiments were conducted 6 and 12 months after seed harvest to evaluate the influence of water application interval and water amount on germination and survival of broom snakeweed. Treatments consisted of five water intervals: daily, 5-d, 10-d, 15-d, and 20-d, and four water amounts: field capacity (fc), 3/4 fc, 1/2 fc, and 1/4 fc. Seed germination was 42% at daily:fc and no seed germinated at 1/4 fc. Average mean soil matric potential (Ψ_m) at germination ranged from -39 kPa at daily:fc to -1125 kPa at 20-d:1/2 fc. Data suggest that optimum germination occurs when soils are maintained at a minimum Ψ_m > -300 kPa for at least three days. Optimum Ψ_m for seedling survival appears to range between -300 and -900 kPa while mortality would generally be expected near a Ψ_m of -1800 kPa.