TECHNICAL NOTES

Moistening and Heating Improve Germination of Two Legume Species[1]

C. A. SEGELQUIST[2]

Southern Forest Experiment Station, Forest Service, U. S. Department of Agriculture, Nacogdoches, Texas.

Highlight

Germination of *Lespedeza cuneata* and *Desmodium pauciflorum* seeds from eastern Oklahoma was increased by heating them under moist conditions. Seeds of *Desmodium sessilifolium* from the same area germinated well without treatment. Moistening and heating did not increase germination of *Lespedeza virginica* and *L. capitata*; mechanical scarification was very successful with seeds of these species.

Cushwa et al. (1968) found that moistening and heating increased germination of *Cassia nictitans* L. seeds collected in Florida. The study described here was done to determine whether similar treatment would improve germination of five common legumes found in the prairies of eastern Oklahoma. The species selected for testing were: *Desmodium sessilifolium* (Torr.) T. & G., *D. pauciflorum* (Nutt.) DC., *Lespedeza virginica* (L.) Britt., *L. cuneata* (Dumont) G. Don, and *L. capitata* Michx.

Methods

Seeds were collected from standing plants near Stillwater, Oklahoma, in February 1970. They were cleaned and groups of 60 were assigned to heat treatment at a temperature of 40, 60, 80, or 100 C for 1, 2, 4, 8, 16, or 32 minutes.

To provide ample moisture, each group of seeds was placed in a folded paper towel, which was moistened and covered with aluminum foil. The package was placed in an oven set at the prescribed temperature. A thermometer was inside the packet, and the timing interval was begun when the temperature in the center of the packet reached the specified level. Controls were also placed in foil packets and moistened, but they were not heated. Each treatment was applied to one group of 60 seeds.

Following treatment seeds were placed in Petri plates on moistened filter paper blotters and germinated seeds were counted at intervals of 3, 6, 9, 12, 16, 27, and 33 days.

Results

The rate of seed germination was not affected by any treatment. Most seeds that germinated did so from 3 to 6 days after the tests began, and in all species germination was essentially complete after 16 days.

Heating *L. cuneata* seeds to 60, 80, and 100 C increased germination (Fig. 1). It only took 1 minute at 80 or 100 C to stimulate germination, but required 4 minutes at 60 C to cause an increase. No germination occurred after 32 minutes at 100 C. Tempera-

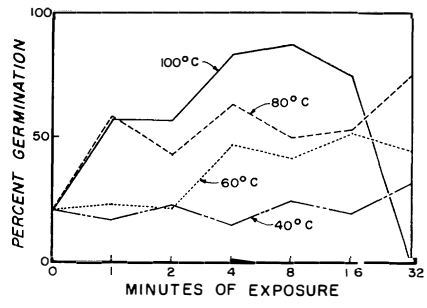

FIG. 1. Response of *Lespedeza cuneata* to moistening and heating.

[1] Received October 30, 1970.

[2] Stationed at the Wildlife Habitat and Silviculture Laboratory, which is maintained by the southern Forest Experiment Station in cooperation with Stephen F. Austin State University.

tures of 60 and 80 C appeared to improve germination of *D. pauciflorum* seeds (Fig. 2). The 100 C treatments never improved germination of this species, and exposure for 8 or more minutes was highly detrimental.

Heat treatment did not increase germination of *D. sessilifolium* seeds, but exposures of 80 C for 32 minutes and 100 C for 8 or more minutes reduced germination.

Germination of *L. virginica* and *L. capitata* seeds was very poor and unaffected by heat treatment. In separate tests, 100 seeds of each of these species were abraded with sandpaper and then placed in Petri dishes. Following this treatment, germination of 98% was obtained for *L. virginica* and 100% for *L. capitata* seeds.

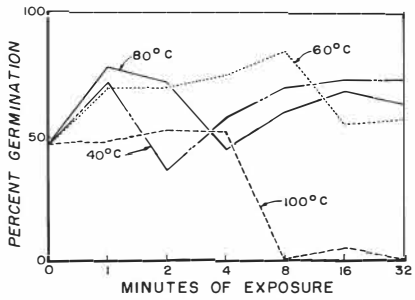

FIG. 2. Response of *Desmodium pauciflorum* seeds to moistening and heating.

Literature Cited

CUSHWA, C. T., R. E. MARTIN, AND R. L. MILLER. 1968. The effects of fire on seed germination. J. Range Manage. 21:250–254.