SEED HAIRS AND SEED GERMINATION IN *POPULUS*[1]

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Two experiments were conducted to study the effect of the presence of seed hairs[2] (the "coma" or "cotton") on the germination of quaking aspen (*Populus tremuloides* Michx.) and cottonwood seeds. Einspahr (*1*) had stated that sowing seed of quaking aspen with the "cotton" adhering does not work well, and Maini (*3*) reported the presence of water-soluble germination inhibitors and growth inhibitors in the seed hairs of that species.

Methods

In the first of these experiments, four 25-seed replicates each of fresh quaking aspen, narrowleaf cottonwood (*Populus angustifolia* James), and Rio Grande cottonwood (*Populus fremontii* var. *wislizenii* S. Wats.) were germinated both in "seed hair" and control germination chambers, which consisted of sandwich-sized plastic boxes containing blotter germination pads. For the "seed hair" chambers, an extract was prepared by soaking a large quantity of seed hairs in distilled water for 24 hours. The blotters were then wetted with this extract. Subsequently, a mat of seed hair was spread in the "seed hair" chambers, and the seeds were sown on top of the mat. As chambers required watering, the controls were watered with distilled water and the "seed hair" chambers were watered with seed-hair extract. Germination was observed for 17 days.

Since it appeared that the seeds sowed on the seed hairs germinated more slowly than those in the control chambers, a second experiment was conducted. In this experiment, eight 25-seed replicates of quaking aspen seed that had been stored dry in glass vials at -18° C for 6 months were prepared under each of three treatments: control (as above), seeds placed on top of a seed-hair mat (as above), and seeds covered by a seedhair mat. This test was continued for 16 days.

Results

In the first experiment, germination percentage of fresh seed of both quaking aspen (98.5 percent) and of narrowleaf cottonwood (100.0 percent) was significantly greater than that of Rio Grande cottonwood (0.6 percent), at the 0.001 percent level of probability (t-test). No significant difference in germination percentage, however, was attributable to the presence of seed hairs and seed-hair extract in the germination medium, for any of the species studied.

In the second experiment, using stored quaking aspen seed, germination of seeds placed on top of a seed-hair mat was significantly lower (56.5 percent) than seeds placed either under a seed-hair mat (94.0 percent) or in the control chambers (91.0 percent), which did not differ from each other.

Discussion

The results of this study do not support the contention of Maini, in that the presence of seed hairs and seed-hair extract did not significantly affect the germination percentage of fresh quaking aspen, narrowleaf cottonwood, or Rio Grande cottonwood seed. Rather, the results of our study with stored quaking aspen seed suggest that if the seeds are placed on the seed-hair germination medium, a reduced germination may occur, possibly due to drying of the seed. Strain's (*4*) field observations are in accord with this hypothesis. He noted that 9 days after the first quaking aspen seedlings were observed on his field quadrats, only those seeds that were in direct contact with moist mineral soil had germinated, whereas those with the coma (seed hairs) still attached had not germinated. It thus appears that the more plausible explanation of the adverse effect

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[2]These hairs originate from epidermal cells on the funiculi of ovules, not from the ovules or the seeds themselves (Fechner, 1972), as the name "seed hairs" implies.

of seed hairs on seed germination of quaking aspen is one of denying moisture to the seed, not one of production of germination inhibitors.

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