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Cold soils delay the development of aspen root suckers

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Root suckers are the main means of regeneration of aspen after a disturbance kills or removes the aboveground portion of the clone. In some circumstances, however, there is insufficient suckering to successfully restock aspen stands. Insufficient parental roots, soil compaction, and/or root damage have been associated with poor suckering; however, cold soils, as a result of thick litter layers, have also been suggested to be a major reason for poor suckering. There is conflicting literature on the suckering of aspen in cold soils. Some literature suggests that suckering does not occur below 15°C; however, many aspen sites in the boreal forest do not reach soil temperatures much above 15°C.

We conducted several experiments that tested the suckering response of aspen roots at various soil temperatures ranging from 8°C to 20°C. The experiments used either excised section of aspen roots



seedlings that were grown in large pots. Both sucker bud development and sucker emergence were considered in this analysis.

Our experiments showed that sucker buds (red arrows) develop on aspen roots at soil temperatures as low as 8°C, but virtually none of these buds expanded and emerged as suckers when grown at this temperature.



Suckers did develop at 12°C but these were significantly delayed relative to suckers growing on roots at 20°C. Timing of sucker development was related to the accumulation of heat-units experienced by the roots.



Implications: While sucker buds can be initiated in cold soils, warmer soil temperatures are required for the expansion of these buds to suckers. This is relevant especially for landings or areas with large accumulations of slash or organic litter. Roots will likely develop sucker buds under the slash, but these will not develop into viable suckers. If cold soil

conditions persist, root reserves will decline, eventually resulting in root death. In contrast, in warm soils, suckers buds will rapidly grow into suckers allowing leaf area to develop quickly, effectively capturing the site. We expect that the early site capture will result in higher productivity of the future aspen stand.

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Further Information:

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