



**Does it matter who competes with whom: soil fertility affects competitive interactions among local tree species in unexpected ways.**

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Whether plant competition grows stronger or weaker across a soil fertility gradient is an area of great debate in plant ecology. Forest management decisions could also benefit from better understanding plant competition in order to carefully match stand species composition to stand soil nutrient availability. With only four dominant tree species (lodgepole pine, interior spruce, subalpine fir and trembling aspen), the sub-boreal spruce forest is an ecosystem for which we can potentially identify species-specific competitive effects and responses and determine how these change with soil fertility. We tested different hypotheses with a data set of 2227 stem-mapped trees in local forests. Competition, fertility and their interaction affected radial growth rates for all four species, but each species supported a different alternate hypothesis for how competitive interactions changed with soil fertility. For example, reductions in radial growth rates due to neighbourhood crowding decreased with decreasing soil fertility for trembling aspen but increased with decreasing soil fertility for lodgepole pine. The intensity of competition among these species was species- and context-specific and more complicated than predicted by any one of the dominant existing theories in plant ecology.

