

## **A METHOD TO CONTROL SMOOTH SUMAC WHILE MAINTAINING PRAIRIE BIODIVERSITY**

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*Abstract:* Historically, smooth sumac (*Rhus glabra* L.) occurred at relatively low densities on most North American prairies. Changes in disturbance regimes allowed it to increase rapidly threatening prairie productivity and biodiversity. We evaluated herbicides and methods of application to reduce smooth sumac while maintaining biodiversity. The experimental design was a randomized complete block with 13 herbicide treatments and one control per block. Three blocks were located in an area burned in May and three were located in an unburned area. We applied eight herbicides or combinations of herbicides in June as a foliar spray and five herbicides or combinations with a wick to a tallgrass prairie in eastern Nebraska with a smooth sumac density of 1.71 stems/m<sup>2</sup>. Herbicides included 2,4-D low volatile ester, picloram, triclopyr, clopyralid, and glyphosate. The experiment was repeated a second year. Forb frequencies were determined, and live smooth sumac stem densities were counted for two years following treatment. Stem densities in all burned plots (0.27 stems/m<sup>2</sup> ± 0.06) were greater than stem densities on non-burned plots (0.14 stems/m<sup>2</sup> ± 0.04). Smooth sumac was reduced compared to the control ( $P=0.0001$ ) regardless of the herbicides or the method of application. Frequencies of some forbs were four times greater where herbicides were applied with a wick rather than as a broadcast spray. Based on these results, we developed a practical and relatively inexpensive method to control smooth sumac without negatively influencing forbs or other shrubs. This application method can be adapted to suppress other less desirable woody species.