



Evaluation of Skunkbush Sumac *Rhus trilobata*

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ABSTRACT

*A study was initiated to find a leaf spot resistant skunkbush sumac (*Rhus trilobata*) that would perform well in eastern North and South Dakota conservation plantings. Seed from 24 promising native stands was collected, grown in a greenhouse, planted in a replicated block and evaluated for three years. All plants showed varying degrees of leaf spot disease from a rating of 2, (leaf spots covering 10-20% of the total leaf surface on the plant) to 6 (leaf spots covering 60-70% of the leaf surface on each plant.). A later addition to the planting, *Rhus aromatica* 'Konza' released by the Manhattan, Kansas Plant Materials Center, showed the least amount of leaf spot and exhibited the highest vigor of any of the seed sources. After two years of observations, it appears if there is still a need for a sumac in the eastern Dakotas 'Konza' would be the recommended source. Due to changing PMC priorities, this study has been discontinued. The material will be maintained for future researchers.*

INTRODUCTION

Skunkbush sumac is a deciduous, flowering native shrub growing from 2 to 12 feet tall, averaging 4 feet tall. It has both a taproot and a fibrous root system. Roots are deep and extensively branched with somewhat shallow, spreading woody rhizomes. It sprouts readily from the root crown, especially after a severe disturbance. Sumac prefers well-drained sites, but is tolerant of most soil textures. It is intolerant of flooding and high-water tables, but tolerant of a wide range of soil pH. (Francis 2004)

Native to the Great Plains and the intermountain West, it is generally found west of the Missouri River. *Rhus trilobata* closely resembles *R. aromatica*, a more eastern species, and is often treated as a variety of *R. aromatica*. *R. trilobata* succumbs to wide-spread leaf rust infestations when planted east of its native range. *Rhus trilobata* 'Bighorn', a Wyoming seed source released by the USDA-NRCS Plant Materials Center, Los Lunas, New Mexico, is subject to the same rust infestations as the native *R. trilobata* when planted in eastern Dakota precipitation zones. (Francis 2004)

The study objective was to find seed sources from the eastern part of skunkbush sumac's native range and test for rust resistance. Proven seed sources would be developed for planting in the eastern Dakotas.

MATERIALS AND METHODS

Seeds were collected from native stands in North and South Dakota beginning in 1999 and continuing through 2007. Bighorn sumac, a 1979 release from the USDA-NRCS Plant Materials Center, Los Lunas, New Mexico, was also included. In 2008, seeds were planted in the greenhouse and in May 2010, the seedlings were planted in a field at the Plant Materials Center, Bismarck, North Dakota. Each of the 24 accessions were planted in three-plant plots. There were three replications. In an effort to maintain equal competition within and between rows, Riverview Germplasm American black currant (*Ribes americanum*) seedlings were planted in gaps resulting from missing plants of an accession. The black currant, however, was removed in 2011, and replaced with Konza skunkbush sumac (*Rhus aromatica*), a release from the USDA-NRCS Plant Materials Center, Manhattan, Kansas. The entire planting was seeded to blue grama in 2011 to reduce maintenance costs.

The planting was maintained using herbicide, hand pruning, and rogueing. Woody contaminants were removed by periodic cutting and stump treatment. The weeds immediately adjacent to each plant were controlled by hoeing the first year. Casoron® 4G was applied at 150 lbs/acre in 3 to 4-foot diameter circles around each plant in November 2011 to control annual and perennial weeds and grasses. In June 2012, clopyralid was broadcast applied at 3 ml/3 gallons water/3000 ft² to control a heavy infestation of thistle.

Field plot evaluation began in the fall of 2010 and continued through 2012. Plants were scored 1-9 for leaf diseases. A score of 1 indicated very little evidence of leaf spots and a score of 9 indicated the entire leaf was covered with leaf spot. See **Table 1** for average leaf disease ratings on the shrubs in 2012. A complete set of data from 2010 through 2012 is available from the Plant Materials Center or can be found in the PMC's Technical Report, 2014; Part 2 of 2: Trees and Shrubs.

The planting continues to be maintained but no data is formally being collected.

RESULTS AND DISCUSSION

Most plants exhibited leaf spot disease beginning in 2010. In 2011, most plants showed moderate to severe leaf diseases. Bighorn sumac was the most susceptible to leaf rust compared to all accessions. Bighorn was also subject to severe stem breakage at the ground line. The broken stems remained attached to the root collar and alive but easily torn off with maintenance equipment. According to its staff, Bighorn sumac does not break down at the Plant Materials Center, Bridger, Montana. Observations in July 2012 showed 30-80% of the sumac leaves were brown with curled leaf margins; a classic sign of herbicide injury. General observations showed

Table 1. Average leaf disease 2012, skunk-bush sumac study at USDA-NRCS Plant Materials Center, Bismarck, North Dakota

Accession (seed source)	Average disease all plants*
9009467	2.6
9092058	2.6
9092059	2.5
9092060	2.9
9092061	3.4
9092062	2.4
9092063	2.8
9092064	2.2
9092065	2.4
9092066	2.9
9092067	2.3
9092069	2.9
9092128	2.6
9092130	2.9
9092217	2.6
9092219	2.9
9092220	2.2
9092222	2.9
9092223	2.8
9094338	2.7
9094346	2.6
9094347	3.2
9094348	2.6
Bighorn	4.0
Konza	1.5

*1 = least incidence,
9 = greatest incidence

Konza with the least amount of apparent herbicide injury. Clopyralid herbicide, applied earlier in 2012, appeared to be the cause of injury even though it is labeled for use on sumac. After discussion with the chemical representative (Dow Agra), it was concluded that the labeled sumac was probably staghorn sumac (*Rhus typhina*). Staghorn sumac is native to the area where the herbicide was originally tested. Skunkbush sumac appears highly sensitive to clopyralid herbicide.

CONCLUSION

Most skunkbush sumac appears susceptible to leaf spot disease. Of the accessions evaluated at Bismarck, North Dakota, Bighorn sumac was the most susceptible to leaf diseases. Sumac species react differently to clopyralid herbicide. Skunkbush sumac appears very sensitive to clopyralid herbicide. Blue grama, a C-4 plant, can be effective in maintaining ground cover and erosion control in shrub plantings. Konza aromatic sumac was least susceptible to leaf spot diseases and was vigorous. Konza would provide a sumac for planting in the eastern Dakotas.

The study is terminated due to shifting priorities and an already available sumac cultivar adapted to the eastern Dakotas.

LITERATURE CITED

Farmer, R.E. Jr. 1997. Seed Ecophysiology of Temperate and Boreal Zone Forest Trees. DelRay, FL: St. Lucie Press. p.12

Francis, John K., 2004, Wildland Shrubs of the United States and Its Territories: Thamnic Descriptions, Volume 1, United States Forest Service, pg. 634.

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