



Rocky Mountain Research Station Science You Can Use *(in 5 minutes)*

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Jumpstarting Recovery of Wyoming Big Sagebrush and Other Native Plants out on the Range

Sagebrush, Invasive Grasses and Wildfires Don't Mix

Wyoming big sagebrush may not be the most eye-catching plant on the Great Basin's rangeland, but it provides vital wildlife habitat and forage for numerous species such as the greater sage-grouse. Yet sagebrush is on the decline. Spreading invasive exotic annual species are contributing to more frequent wildfires on the range.



Wyoming big sagebrush two years after being seeded in the Great Basin (photo courtesy of M. Fisk).

Mature sagebrush often die when a fire burns through, and even worse, its seed bank is also negatively impacted. Without a viable seed bank, sagebrush regeneration is sporadic and requires windborne seed dispersal from unburned areas. Other native perennial species may resprout following a wildfire, but their numbers are often insufficient to prevent invasive species from rapidly dominating the burned ground. To stave off such a scenario, land managers will reseed with sagebrush and other native perennials to restore the landscape.

There's a Science to Planting Seeds

Unfortunately, postfire seeding doesn't always result in successful establishment of native species. This is why a team of researchers led by Nancy Shaw, an emeritus research botanist, and Jeff Ott, a research geneticist

KEY FINDINGS

- Burned low-elevation sagebrush sites can be seeded with mixes of native grasses, forbs and shrubs using rangeland drills adapted for seeding large and small seeds in separate rows.
- Seeding technique, timing of seed application, and seeding rate are important considerations when seeding Wyoming big sagebrush.
- The best techniques for establishing Wyoming big sagebrush are seeding at high rates via a drill in late fall.
- Success of seeding treatments on semiarid sites is ultimately dependent on weather conditions and competitive pressure from invasive weeds, and it may be best to delay treatments until conditions are predicted to be favorable, depending on the feasibility of weed control at the site.



with the Rocky Mountain Research Station (RMRS), conducted a multi-year study to identify which seeding practices resulted in higher plant establishment.

At three Great Basin sagebrush sites that burned in 2007, 2008, and 2010, researchers installed experimental plots and tested seeding methods for native seed mixes. Seeding methods included two types of rangeland drill (conventional and minimum-till) that planted seeds at different depths based upon seed size; small seeds were placed near the soil surface and large seeds in deeper furrows. It turns out that small-seeded species such as sagebrush established better with the minimum-till drill while the conventional drill resulted in higher establishment for larger-seeded species. Additional experiments with Wyoming big sagebrush showed that broadcast seeding in the fall and drill-seeding at a higher seeding rate also improved establishment.

One result that impressed Ott was the successful establishment of native species overall. “In the past there’s been a reluctance to use natives because they’ve been less reliable than commonly used non-native cultivars that establish quickly,” he says. “But our study showed that native species establishment can be successful when using appropriate techniques under the right conditions.”

Seeding for Sagebrush Success

With these results, land managers can identify the best technique for postfire seeding of native seed mixes.



Scientists with the Rocky Mountain Research Station determined that using a minimum-till drill when conducting postfire seeding results in higher seedling establishment of Wyoming big sagebrush (photo courtesy of M. Fisk).

FURTHER READING

Ott, Jeffrey E.; Cox, Robert D.; Shaw, Nancy L. 2017. Comparison of postfire seeding practices for Wyoming big sagebrush. *Rangeland Ecology and Management*. 2017. 70: 625-632. www.fs.fed.us/rmrs/publications/comparison-postfire-seeding-practices-wyoming-big-sagebrush

Ott, Jeffrey E.; Cox, Robert D.; Shaw, Nancy L.; Newingham, Beth A.; Ganguli, Amy C.; Pellant, Mike; Roundy, Bruce A.; Eggett, Dennis L. 2016. Postfire drill-seeding of Great Basin plants: effects of contrasting drills on seeded and nonseeded species. *Rangeland Ecology & Management*. 2016. 69(5):373-385. <https://www.fs.usda.gov/treearch/pubs/52546>

If restoring the Wyoming big sagebrush is the goal, postfire seeding is more successful in the fall with minimum-till drill methods and seeding at a higher rate. Another consideration is selecting a seed mixture whose species won't outcompete the sagebrush, or place sagebrush in separate drill rows to reduce competition.

Yet even science can't overcome nature. Even these refined seeding methods can't guarantee plant establishment, Ott warns. “If the weather doesn't cooperate or if there is heavy competition from invasive species, the seeding may not work. In some cases, it may be worthwhile to consider delaying seeding treatments until conditions are favorable. Additional measures may need to be taken to control invasive weeds in the interim.”

Jeff Ott is a research geneticist with the Rocky Mountain Research Station. His research focus is on the effects of fire and other disturbances on plant communities of the Intermountain West, and the effectiveness of post-fire seeding for establishing perennial plants and reducing proliferation of annual weeds. Ott can be contacted at jeott@fs.fed.us or connect with him at www.fs.fed.us/rmrs/people/jeott

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