Research shows pairing herbicides with prescribed burning improves downy brome control

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Perennial grasses and forbs released after burning and indaziflam treatments at Hall Ranch study site near Lyons, Colorado, USA. Credit: Shannon Clark.

Downy brome is an annual winter grass invading millions of acres of western rangelands and wildlands. It emerges early in the spring while native perennials are still dormant and creates dense mats of litter as it dies back at the end of its growing season. As a result, it can outcompete native vegetation and increase both the frequency and severity of wildfires.

Scientists writing in the journal *Invasive Plant Science and Management* describe a multiyear study that explored the benefits of pairing prescribed burning with the residual herbicide indaziflam—a proven tool for restoring sites that have been degraded by invasive winter annual grasses. The team applied indaziflam alone and in combination with other herbicides to both burned and unburned sites.

The study showed that pairing burning with indaziflam treatments provided better control than either method used alone. Burning removed downy brome litter and stimulated native species, while the herbicide impeded emergence of new downy brome seedlings from the soil seedbank.

"Following the burning with indaziflam provided longer-term benefits," says Rachel Seedorf, a member of the research team. "It helped to maintain and improve plant community diversity while providing multiyear downy brome control."

One further benefit of the combination treatment: Removing downy brome litter through prescribed burning meant lower indaziflam rates could be used since more of the herbicide reached the soil.

Researchers also found that combining indaziflam with a selective, postemergence herbicide could help land managers extend the application window. Combining indaziflam with imazapic or rimsulfuron provided a wider application window than combining

indaziflam with glyphosate. In addition, applying a selective, post-emergence herbicide with higher rates of indaziflam was shown to be an effective option for controlling downy brome in arid sites where litter hadn't been burned.

More information: Rachel H. Seedorf et al, Prescribed burning followed by indaziflam enhances downy brome (Bromus tectorum) control, *Invasive Plant Science and Management* (2022). DOI: 10.1017/inp.2022.11

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