



MANAGE WEEDS

by reducing deposits
to the seed bank

No one wants weeds on their property because weedy and invasive species spread quickly and are detrimental to land.

For those plants that reproduce by seed, whether annual or perennial, management practices should focus on eliminating the seed bank and not necessarily the plants themselves.

Is the weed species a perennial, annual, or something in between? Although killing bad *plants* might be satisfying, if the plant is an annual, which have one-year lifecycles, was anything really accomplished?

Often the answer may be no. Seed banks, live seeds stockpiled in the soil from previous years, are the sole source of future weed populations for annuals and perennials that reproduce only by seed.

Management practices should



University of Wyoming Extension invasive plant ecologist Dan Tekiela discusses the types of herbicides and research parameters in a cheatgrass research project.

ensure new seed production is stopped, but decreasing a seed bank is not easy. There are no commercially available herbicides capable of killing a seed. Instead, at best, we are capable of killing plants immediately as they germinate.

We can only indirectly combat a seed bank. This can be done through a combination of reducing new seed deposits by keeping weed plants from setting seed and keeping new seed from coming in from elsewhere (hitching a ride on equipment, getting deposited through the manure of an animal, or by other means), or inhibiting successful seed germination through practices such as deep tillage or herbicide.

Annuals

Annual weeds germinate, grow, produce seed and die in one season. Killing the weed before it sets seed will prevent more seeds going into the seed bank. However, if *new* seed production is not totally suppressed, we may not actually be reducing the seed bank. This is because often the soil is already full of seed, and many weedy and invasive plants produce

a tremendous amount of seed per plant. For example, imagine an effective management event that kills (or otherwise keeps from setting seed) 95 percent of a certain annual weed. If the seed bank of the species is saturated at 1,000 seed per square foot and the 95-percent success rate means that there is still one live plant per square meter (that then produces 10,000 seeds), then the management was 100 percent unsuccessful.

Perennials

Perennial weeds complete their lifecycle in two or more years. The perpetual nature of perennial plants adds another layer of complexity in their management. Perennial plant weeds *do* require focusing on the plants in addition to the seed bank. Without management of the perennial

weed plants, new seed will continuously be produced by the plants, re-saturating the seed bank. But always remember, even when managing the plants appears successful, the task of fighting the seed bank will still remain for many years.

Keep Up the Fight

If it has not already become apparent, fighting seed banks is a long-term commitment. In fact, while some species like kochia produce seed that only lives for less than two years in the soil (after that it will not be alive to germinate and produce new plants), others species have far greater longevity. Cheatgrass was recently shown to have a seed bank persistence of about five years, and some weed seeds have been shown to persist for over 25 years!

Even after the seed bank has been reduced by 99+ percent, active monitoring to identify the few remaining individuals is critical. If those few plants are allowed to set seed, management could be set back by years. This is also why scouting your property to identify weeds and controlling them before they have a chance to create a large seed bank is so important. Infestations are much easier to control and possibly eradicate when they are small.

Prevention of any seed production should be considered a top priority. Nonetheless, if a weedy or invasive species is already well established, the fight must be taken to the seed bank. This is one time when bankruptcy is a success!

Dan Tekiela is the University of Wyoming Extension invasive plant ecology specialist and can be reached at (307) 766-3113 or at dtekiela@uwyo.edu.

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