

SOWING Local Ecotypes of NATIVE SEEDS to produce 100% native cover in six months in cheatgrass, with the native seedlings allelochemicals permanently suppressing the cheatgrass seeds in the soil from ever sprouting. Copyright © 2022 by Craig Carlton Dremann
The Reveg Edge, P.O. Box 361, Redwood City, CA 94064.
Office 650-325-7333. Email: craig@ecoseeds.com
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Website = www.ecoseeds.com/greatbasin.html

Replanting a 100-mile portion of the Tuscarora gas pipeline north of Reno in the early 1990s, took me two years of test plot work to be able to plant seeds of the local ecotypes of native grasses in the sagebrush desert in 8-10 inches of annual rainfall, so that their seedlings produced allelochemicals strong enough to completely suppress the cheatgrass seeds in the soil from ever sprouting. And "from ever sprouting" I mean at least for the next 25 years.

The planting of native seedlings is not to "hold off" the cheatgrass—my method is to **permanently convert the cheatgrass back to 100% native cover in six months or less**, by having the native seedlings do the work of suppressing the cheatgrass seeds in the soil from ever sprouting. And would be especially easy to do after a cheatgrass fire, when the cheatgrass-thatch allelochemicals are gone, and your canvas is bare, to apply the native seed-paint.

You should NEVER see a planting like Sarah Kulpa's 2019 Nevada fire USFWS native seed sowing project-- 2 squirreltail plants sprouted among an ocean of cheatgrass?



Photos left: 2019 Nevada Rebel Creek fire planting, with two squirreltail plants in an ocean of cheatgrass to the horizon. https://www.flickr.com/photos/usfws_pacificsw/49998916556.

Right: Bluebunch wheatgrass sown property north of Reno, and no cheatgrass plants.

Using the allelochemicals of the native grasses, and permanently suppress cheatgrass seeds from ever sprouting, should be adopted to convert the hundred million acres of cheatgrass back to fire-safe natives, instead of the old cheatgrass methods that do not get back to solid natives.

In order of importance, here are the issues:

1.) Zombie grasslands--We did a survey of the 100-miles we were going to replant, and measured the basal diameters of 100 plants in a population to produce an age-pyramid--looking for seedlings and young plants. All along those 100 miles, only found one population that was producing seedlings, all of the others were very old plants with bare space in between and no seedlings--they had stopped reproducing a long time ago, maybe 50-100 years ago.

I wrote an article about detecting Zombie ecosystems

at https://www.researchgate.net/publication/348588754_1-SEARCHING-FOR-ZOMBIES

Then, it took us another year to figure out why we were encountering Zombies, and how to get the populations reproducing again. That was the key to our success in producing 100% native cover in six months, and 25 years later that planting is still 95% native cover. And this item is one of my most important trade secrets that I license with my method.

2.) Local ecotype seeds ONLY--NO exotics, NO cultivars, and NO SEED MIXES. The biggest hurdle that everyone in the Great Basin talks about, but few realize when they try and use natives that are Cultivars, or to make the cost cheaper, they mix in exotics. Then, even if they have local native ecotype seeds, they make the massive blunder of putting those seeds together as a seed mix, which destroys the effect you are trying to have against the cheatgrass.

You want the allelochemicals of EACH native seedling, to be used against the cheatgrass and not against another native. So instead of sowing a mix that fights each other, you need to sow individual species as a MOSAIC. You need to remember that each species of local native has its own allelochemical effect, as if each was producing a different strength of antibiotics.

3.) How much of each native seed do you sow, to get the allelochemical effect you need?

I invented a way to assign a number to indicate their allelochemical strength of each species, from 1 to 100, so you can put down the natives against the weeds like laying down a higher card in a card game. If the weed is rated as a "5" you can add a native that is a "6" and get rid of the weed. This is the easiest method of fighting the cheatgrass or any other weed, if you know its "number" and the number of each of the natives you want to plant in its place.

This allelochemical-rating method is available under a license, called the "Species-Threshold Test." Actually cheatgrass has a very low number, which is why it is very easy to get rid of it with just about any native grass or native wildflower, if you do it correctly.

4.) SOW each native in the CORRECT place. There is a reason why Great Basin wild rye grows in one area, and not another area right nearby, or where the Poa grows or the Indian Ricegrass grows, and those areas are NOT interchangeable. You cannot try and sow Great Basin wild rye in an Indian ricegrass, Thurber's needlegrass, or Needle and Thread land--it will never work. Map where the existing native species grow, and add to those populations.

5.) EVERYONE AVOIDS doing their test plots, to test their seeds and sowing methods.

It is basic science, if you think something is going to work, you test it on a small scale first, and when sowing natives to get rid of cheatgrass NOBODY ever does. There are 400 researchers getting paid \$100 million a year to figure out how to fight cheatgrass for the last 20 years, and Sarah Kulpa's photo clearly shows us, that none of them have figured it out yet?

The scale of each test-plot treatment needs to be 3 x 6 feet, no larger. If your planting method or seeding does not work in 3 x 6 feet, it is not going to work on any larger scale. And NEVER blame drought for your failures--if the cheatgrass can grow, your natives should be able to.

6.) The first and BIGGEST issue in native plantings--WHAT IS LOCAL? And then, how do you get the bulk quantities you need per acre, to completely suppress the cheatgrass seeds from sprouting in the future. The traditional recommendation of a few pound per acre is no match for the cheatgrass seedlings. Your test plots will show you for each native species, what

the proper pounds-per-acre requirement will be. Then, you can calculate the multi-million dollar budget to get those native ecotype seeds in the right quantities you need to fight the cheatgrass.

NOT using local native ecotype seeds is probably the most common reason for native planting failures, especially in the arid West. See David Pilliod's report about planting in the Great Basin of 69% native seed sowing failure rates at <https://pubs.er.usgs.gov/publication/70180019>

The minute you plant your native seeds, they need to be able to hit the ground running and suppress the cheatgrass seeds in the soil, to grow and produce allelochemicals in adequate quantities and strength to keep those cheatgrass seeds from ever sprouting.

One method to determine "What is local" is to collect samples of seeds of an individual species on a checkerboard from a 15 x 15 mile grid--at least one sample per square. Then, plant those seeds in a "Common Garden" plot where they are each given the same soil, water, fertilizers, etc. and grow for one season. If they are genetically identical they will all look like Johnny Apple Seeds tossed them all out of the same seed sack. See the study of ecotypes at <https://www.ecoseeds.com/juicy.gossip.three.html>

CONCLUSION:

--Are ZOMBIES present, if so, you need to find a method to get the local native plants to start reproducing again.

--BULK LOCAL NATIVE SEEDS!!! *Without them, you cannot even do test plots.*

--Never sow any EXOTICS, no CULTIVARS, and no SEED MIXES.

--TEST PLOTS, TEST PLOTS, TEST PLOTS *until you get 100% native cover in a cheatgrass area in six months or less.*

--DETERMINE the Allelochemical number of each weed and each native you want to plant in their place.

--MAP the existing stand of natives, and only sow in the species that already exist--Do not try and add species that are not already growing there. Please do not shuffle the native plant cards--deal them back where they belong.

--WHAT IS LOCAL? How far can you go to get your stock seeds for your project?

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