Repetitive Overseeding Can Replace Herbicides To Conquer Crabgrass

Cornell Cooperative Extension
Rensselaer County

David Chinery, Senior Resource Educator, Cornell Cooperative Extension of Rensselaer County. 61 State Street, Troy NY 12180

Would you like a better lawn without using herbicides? Although many Americans have been told that having a better lawn means using chemical herbicides, that isn't the only solution. Lawns infested with annual weeds, most notably crabgrass, can be improved through a technique called repetitive overseeding. First pioneered at Iowa State and Cornell Universities for sports fields, we've been demonstrating how repetitive overseeding can benefit lawns here in Rensselaer County, New York, for almost fifteen years. Beginning in August, 2017, we conducted a small repetitive overseeding project at the 9/11 Memorial Park in the Lansingburgh section of Troy. This fact sheet details our results.

The lawn at the park was sodded long ago, but by the time our project started there was virtually no desirable turfgrass remaining. A combination of drought, lack of fertilizer, low mowing and scalping, and damage from white grubs (which eat the roots of turfgrasses) killed the original sod. These forces led to the majority of the ground being covered with crabgrass, with low populations of prostrate spurge, white clover, and dandelion also present.

Crabgrass is an annual weed with coarse green leaves which germinates from seed in early spring and grows rapidly. (Photo 1). If left unchecked, the crabgrass creates a dense cover during the summer. After producing seeds, it starts to die in autumn, leaving the soil bare and exposed to erosion over the winter (Photo 2). The following spring, new crabgrass seedlings emerge again. Chemical lawn-care programs rely on pre-emergent herbicides, applied in early spring every year, to keep these new crabgrass seedlings at bay. Thousands of acres of lawns are treated with pre-emergent herbicide in New York State. These applications are made by do-it-yourself homeowners as well as certified pesticide applicators. Repetitive overseeding can offer an alternative to using herbicide every year.

How does repetitive overseeding work? Our method of repetitive overseeding takes advantage of the annual lifecycle of the crabgrass plant. Quick germinating perennial ryegrass seed is spread on the lawn multiple times, beginning in August. As autumn approaches and the crabgrass dies, the perennial ryegrass establishes, so that by late fall, what would normally be bare soil is now covered by new seedlings. In the spring, the perennial ryegrass will prevent the germination of new crabgrass seedlings by crowding them out, and pre-emergent herbicide will not be needed. *Thus, our repetitive overseeding method can reduce or eliminate the need for pre-emergent herbicide and be the cornerstone of a pesticide-free lawn-care program.*

Overseeding is simply spreading grass seed over the existing lawn (Photo 3). There is no turning of the soil (such as rototilling). Holes are not made in the soil (as in core aerating or spiking), nor is the seed incorporated into the ground (as in slit seeding). All that is needed is a simple lawn spreader, such as is used to apply fertilizer. After the gauge on the spreader is set to deliver the desired amount, simply pour the seed into the hopper and start spreading. The applied seed will eventually work down to the soil surface, and if conditions are favorable, it will germinate. We call it repetitive overseeding because it should be done several times during the late summer and autumn. This increases the chances of applying the seed when temperature and soil moisture conditions are favorable. By applying an excess of seed (which is relatively inexpensive and pesticide-free) it is very likely that a high percentage will germinate.

Our project: At Lansingburgh's 9/11 Memorial Park, we established six different overseeding plots to study how variations on the method influence final results. The variables examined were:

1. Type of grass seed (perennial ryegrass or tall fescue). Past projects showed that perennial ryegrass is often quicker to show results than tall fescue. We spread the perennial ryegrass seed at a rate of 3 pounds of seed per 1,000 square feet of lawn and the tall fescue at a rate of 4 pounds of seed per 1,000 square feet of lawn.
2. Mowing. We mowed the existing crabgrass short (to 1/2 inch in height) in two plots before the first seeding to see if that might help the new seedlings establish faster. The other plots were not mowed before the first seeding. All plots were mowed occasionally thereafter.

3. Starter fertilizer. Starter fertilizer is often used to supply nutrients, including nitrogen, phosphorous and potassium, to hungry young grass seedlings, and we wanted to see if differences would appear at the park. We used a store-bought starter fertilizer which contained 24% nitrogen, 25% phosphorous and 4% potassium and applied it to three plots. The other three plots received no starter fertilizer. The soil pH at the park is 7.4 (slightly alkaline) and the soil texture is a sandy loam.

What happened? In a year with normal rainfall, four applications of seed, spaced two to three weeks apart, would be adequate to establish a dense turfgrass cover by October. Unfortunately, August 2017 was a very dry month, with only 1.24 inches of rain for the second half of the month (2.06 inches is average). September was also dry, with 1.68 inches of rain (3.5 inches is average). In October, the dryness continued, with only 0.79 inches of rain up to October 23, the last day of our project. Dry conditions will reduce seed germination significantly. A few new turfgrass seedlings were observed to be poking through the crabgrass on August 31 in all the plots (Photo 4). Through September, these new seedlings persisted, but did not increase, and by October 6, the new seedlings were disappearing due to drought.

In a previous project under similarly droughty conditions, we found that the only plots where we could get new seedlings to establish were those with extremely high seed rates. Since we could not irrigate, but we could spread more seed, the plots were seeded an additional two times, for a total of six times.

Final Results: Conditions remained very dry but by October 23 we were able to see some dramatic results. In Photo 5, a perennial ryegrass plot is the green strip on the left, a tall fescue plot is the green strip next to it on the right, and the surrounding brown areas are the dead crabgrass. More detail is shown in Photos 6 and 7.

In brief, all of the plots had a dense cover of new grass seedlings. Mowing before the initial seeding didn't make a significant difference. Plots which received starter fertilizer had about 10% more new grass established than those which did not. Plots with perennial ryegrass were about 95% covered with new grass seedlings, whereas plots with tall fescue had about 85% new seedlings. Perennial weeds, such as dandelions, persisted (we didn't expect the overseeding to crowd them out). Check plots (which didn't receive seed or fertilizer) were 100% weeds, 95% of which were dead crabgrass by October 23, and are depicted in the brown areas of Photos 5, 6 and 7.

Conclusions: We have shown that both perennial ryegrass and tall fescue can be used to significantly increase turfgrass density (and crowd out crabgrass) when overseeded multiple times in the late summer and autumn. We recommend making four applications of seed, spaced two to three weeks apart, during the late summer to autumn period when there is average rainfall, and increasing the number of applications if weather conditions are dry and there is no irrigation available. Perennial ryegrass will provide faster results than tall fescue. Use of a starter fertilizer will also increase success if soil fertility is poor.

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