

Repetitive Overseeding Can Replace Herbicides To Conquer Crabgrass

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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. In 2017 and 2018, we conducted two new repetitive overseeding projects.

First, The Back Story. 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, a desirable lawn grass, 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 low-tech 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 2017 project: The lawn at the 9/11 Memorial Park in the Lansingburgh section of Troy, NY, 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. In Photo 4, taken in early spring, the crabgrass is only present as last year's dead skeletons, while only the clover is green.



First, 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 likely be adequate to establish a dense turfgrass cover by October. Unfortunately, August 2017 was a very dry month, with only 1.2 inches of rain for the second half of the month (2.1 inches is average). September was also dry, with 1.7 inches of rain (3.5 inches is average). In October, the dryness continued, with only 0.8 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 5). 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.

2017 Results: Conditions remained very dry but by October 23 we were

able to see some dramatic results. In Photo 6, 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 7 and 8.

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 6, 7 and 8.



Our 2018 Project. Will core aerating the soil before overseeding improve success? To answer this question, in 2018 we established plots that were core aerated and seeded ("C & S"), or just seeded ("JS"), three, four, or five times, starting in late August and running into October.

We used perennial ryegrass at the plots located at a private home in Castleton, NY, and tall fescue at the plots established at the Schodack Island State Park nearby.

Core aeration is a process accomplished by a machine called a core aerator (Photo 9). The core aerator pulls plugs of soil out of the ground, which leaves holes. These holes increase the amount of oxygen and water which can penetrate the soil. This process is also useful in reducing the degree of soil compaction, or hardness. The machine we used was the Ryan Lawnaire 28. It has 3/4 inch diameter tines on 3.5 x 5 inch spacing, makes up to 12 holes per square foot and impacts 2.5% of the surface area in one pass. We made three passes on



each test plot with the core aerator machine on each of the three, four or five dates we aerated. We spread the grass seed in the usual way, using the drop spreader, after aerating.

What Happened? Very rainy weather made the ground extremely wet. August had more than 0.75 of an inch of rainfall above average, and September precipitation was well over 2.3 inches above average. While October was closer to normal, there was precipitation on 21 of the 31 days, keeping the ground continuously soggy. Aerating wet soil causes more disturbance than aerating drier soil, so as a result, the aerated plots were “beat up” quite severely each time we used our machine. Because this was a research study, we didn't alter our plan, but horticultural sense would tell us not to aerate under non-test conditions, given the weather.

2018 Results: At Castleton, the greatest cover of new perennial ryegrass was found in the JS plots seeded four times, with an increase of 90%. This is shown in Photo 10, with the seeded plot on the left and the unseeded plot on the right side of the photo. C & S plots seeded and aerated four times had a 66% increase in new seedlings. This is shown in Photo 11, with the C & S plot on the left and the JS plot on the right of the photo. Aerating in combination with seeding in these conditions, therefore, decreased the success of repetitive overseeding. Seeding or seeding and aerating a fifth time didn't pay off in an increase in seedling cover and showed about the same results as plots given four treatments.



At Schodack Island State Park, JS and C & S plots showed virtually the same increase in new tall fescue seedlings, 65%, whether they were seeded four and five times. Aerating at Scho-dack didn't decrease seedling cover but it didn't increase it, either. It is likely that some seed rotted, or failed to germinate, due to the overly wet conditions at both locations.

Final Thoughts: Just how you can use repetitive overseeding will depend on the conditions found on your lawn as well as the current weather. 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. Late August to early October works for repetitive overseeding in upstate New York, but you might need to adjust the timing to fit where you live. Core aerating is not needed unless the soil is heavily compacted. Perennial ryegrass will provide faster results than tall fescue. Continue to mow your lawn at a height of 2.5 to 3 inches during the overseeding period. Use of a starter fertilizer will also increase success if soil fertility is poor. Do a soil test with the help of your local Cooperative Extension office for an accurate picture of your soil's fertility.

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View the video “Repetitive Overseeding: Spreading Seed to Reduce Lawn Weeds” at: <https://www.youtube.com/channel/UC56gjrLFxePlvotgPb6Z1cw>

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