# Grower Information Sheet

## Living Mulch Aisles for Vegetable Fields

Date: February 25, 2013
Farm Name: Regenerative Roots
Address: W6635 Kiesling Rd.  Jefferson, WI 53549
Contact Info: 262-753-6473
Farm Website: www.regenerativeroots.com

About Your Farm
# Years Farming: 5 (Dennis), 7 (Anne)
# Acres: 2
# Shares/Members: 45
Other relevant farm details: Our farm sales are approximately 70% CSA, 20% wholesale, and 10% farmers' market.

## Overview

We maintain a living mulch aisle between all of our vegetable beds and have found many benefits to using this system. We have found it to be very manageable and enjoyable even using very small-scale tools. Soil temperatures remained noticeably cooler, rainfall events caused minimal soil splash onto plants, combined with a semi-mature vegetable canopy, nearly no soil was ever exposed, beneficial insect populations were observably higher than in bare-soil farm systems we've observed, fewer weeds, and we surmise that the soil biology was more diverse and abundant as well. As with any mulch system, however, we did observe some rodent pressure.

We grow mixed vegetables and ground fruits on 2 acres of silty loam. Ideally, we would establish a ground cover of clover(s) and a low-growing, non-spreading grass such as annual ryegrass or some of the fescues commonly used in orchards. In 2012, we had one field entirely established with a dense stand of medium red clover and another field which had no cover crop other than a previously existing stand of rhizomous grass (primarily reed canary) and lambsquarters. The clover had the added benefit of providing nitrogen on plowdown, but in other regards even reed canary performed well. We have also seen this type of system on a tractor scale over many acres.

## Establishing Aisles

For the clover, we tilled 28" wide beds with a walk-behind BCS 735, ideally 1-2 weeks prior to planting to allow for decomposition, though with clover we noticed no adverse effects if we planted a day or two after plowdown other than more trash. We leave an 18" aisle to allow mowing in one pass with a regular walk-behind lawn mower. To measure the beds, we would mow and then till, following a just-mowed path to till the next bed. These widths can easily be adjusted for a tractor-based system. The image to above shows our clover field on June 1st, 2012 with garlic on the left followed by lettuces, beans and cucumbers. The lush clover can be seen on the right in the background. The first aisles (on the left) are larger just because we hadn't really figured out our system yet.

For the other field, we only used a wheel hoe to make the beds after a primary tillage of the entire field in April. The first image on the next page shows our other main production field on August 14th, 2012 with reed canary grass in the aisles. Tomatoes on the right, followed by peppers, fall cabbages and broccoli. The patches of brown visible next to the red cabbage in particular are grasses killed by weeding and left as mulch. The subsequent image is a close-up ground level view from just three days prior.

## Weed/Pest Control

Each row has a line of drip tape. We keep beds clear of weed with a wheel hoe and stand-up diamond hoe. The wheel hoe clears ~8" on either side of the plants and the diamond hoe follows-up for in between plants. Properly used, there shouldn't be a need to hand weed except very occasionally next to the stem of the plant. In 2013 we will widen the bed a little bit by adding tines to the tiller and use a 10" wheel hoe blade instead. We found that the wheels of the lawn mower occasionally got too close to the plants. With our relatively small farm, it was easy enough to move the drip lines into the aisles to avoid damaging them with the diamond how, but with proper care could be left in place.

As the season progressed, the aisles were completely weed free. Granted, reed canary can be considered a weed, but no new plants appeared as they did in the beds, including thistle. By focused all of our weeding efforts on the beds just around the vegetables, we only had to periodically mow the aisles to keep the grass or clover at a manageable height. Reed canary did put out lots of seed heads in the fall, but timely mowing managed that.

Rodent pressure was noticeable on beets, melons and carrots, all crops in the field with clover. Using lower-growing clovers or mowing more frequently would hopefully help. Very little rodent damage was observed in the grass field.

## Living Mulch Crop Selection & Other Observations

We worked with what we had; the landowners had established medium red clover in one field the year prior, and the other field was not originally planned to be used for production. In the future, with more time to plan and implement the system as envisioned, white clovers seem more desirable than red. Traffic was not an issue, but red clover often grew tall enough to flop over into the beds, which would not always get cut by the mower, so we had to hand pull some sections. It did help cover exposed soil, however. White clovers would colonize the beds as the vegetable crop matures. A mix of red and white clover would help diversify the rhizosphere, as red clover has much deeper roots. We haven't worked with fescue, though it seems like a practical alternative to ryegrass as long as it is a variety with the right growth characteristics. Forage varieties will grow taller and require more mowing.

In 2012, we had long stretches of temperatures well over 100 degrees. On one day when the ambient air temperature was 99 F, I measured the soil temperature and air temperature a few inches above the bare ground areas and under the crop canopy, as well as in the aisle. Soil temperature in the aisle and under crop canopy were the same, about 75 F. Bare soil temperature was 92 F. Air temperature under the crop canopy was 90-92 F, while on bare soil was 107 F. We feel this made an enormous difference for plant health as we experienced no blossom drop and maintained high yields on all plants when several other growers we know were reporting severe blossom drop on beans, tomatoes, and/or peppers.