

Sattin Hill Farm Course

Module 16: Weed Management

Introduction

This module delves into Josh Sattin's approach to weed management, including long-term strategies, cultivation methods, and borders and paths.

A solid weed management plan for your farm is crucial. Out-of-control weeds add unneeded stress, consume your time, and ultimately decrease your farm's profitability.

What Is A Weed?

A weed is simply a label we give to a plant growing where we don't want it. Frequently, weeds come in the form of previous crops reappearing in a bed of a current crop (i.e., kale sprouting up in a current bed of lettuce, or carrots appearing in your squash). Weeds could also be native grasses or flowers; every farm has its own native varieties. You need to learn about them and create an effective management strategy.

General Approach to Weed Management

Josh emphasizes being proactive instead of reactive with weed management. If a weed has been left long enough to establish, mature, flower, and go to seed, the battle was lost long ago. His approach to weed management does not even address weeds going to seed. Emphasis is on the early stages of a weed's life cycle.

As with most other aspects of managing a small farm, pre-planning is the key.

Benefits of Biointensive Plant Spacing

The first line of defense for weed prevention is bio-intensive plant spacing. In the market garden space, the term bio-intensive refers to the practice of close plant spacing in a permanent bed system, maximizing yield from a small area.

The goal of bio-intensive growing is strategically spacing your crops where the plants' leaves barely touch each other when they've reached maturity. This forms a natural canopy over the soil, blocking light from exposed dirt. It also holds the moisture in your soil, encourages soil microbial activity, and protects the bed from erosion.

Eradicating Weeds On A New Plot

When preparing a new space to build beds, don't rush the process while eradicating the native weeds and grasses. The first step is taking care of any necessary groundwork: tilling, leveling, digging drainage ditches, etc. Once those steps are complete, pull a silage tarp over the plot with sandbags around the edges to hold the tarp in place. Wait until EVERYTHING underneath is killed off.

Be Patient: Many people have asked Josh how long the tarp needs to cover the plot before they can begin building beds and plantings. His response is always the same: "It takes as long as it takes." It will take longer in the colder months and faster when warmer. It's crucial not to rush this process. You will continue battling weed pressure if you remove the tarp prematurely before everything is killed. If you are patient and wait until everything is completely dead, it significantly reduces weed pressure for years to come.

Chickens Vs. Tarps: Josh has experienced this firsthand. He had plots where he wanted to install his first two tunnels. While rushing to get them into production, he used chickens to clear the plots rather than tarping because tarps would take longer. Chickens do a good job of clearing, but they don't kill everything like the tarp method.

In the plot where Josh set up his third tunnel, he tarped that space for an extended time period. Afterward, this tunnel had virtually no weed pressure to speak of, whereas the other two that chickens cleared have significantly more weeds to contend with.

Building & Maintaining Weed-Free Beds: After the tarps are on the ground long enough to kill all native weeds, it's time to build beds with the deep compost mulch system. As described in an earlier module, this process involves a layer of cardboard on the bed and then applying four to six inches of quality weed-free compost. The cardboard is the first weed barrier. The thick layer of compost serves as the second.

The combination of the tarp, cardboard, and deep compost will set you up for success when starting out. Josh recommends adding more compost each time the bed is flipped for a new crop. This addition replenishes the soil with needed nutrients while it adds another layer of weed suppression.

No-Till Practices

Once your beds are established, maintaining them with the no-till practices will further reduce the risk of weed pressure. In review, these practices are: 1) keep the soil covered, 2) keep the soil planted, 3) disturb the soil as little as possible, and 4) create

diversity whenever possible. For weed management, the primary principles are to disturb the soil as little as possible and keep the soil covered.

All soil has a preliminary “seed bank” built-in. These seeds fell from native plants over many years and are dispersed throughout the topsoil. However, only those seeds in the first inch or so of topsoil germinate and grow. If the layer below it is disturbed and brought to the surface, the next “seed bank” is introduced along with a new flush of weeds. This is why tilling can reintroduce weed pressure. When you avoid inverting the layers of topsoil, you avoid bringing up more weed seeds. The no-till system works well as a weed management strategy.

On traditional tillage farms, you will notice that new weeds grow out of control after plowing the fields in the spring and planting a couple of weeks later. These farms then fight weeds all season long with cultivation and spraying herbicides. You avoid this domino effect if you work to eliminate tillage and inversion of the soil.

Broadfork Only When Needed

The broadfork is a great tool for the first year or two on a new plot. It loosens and aerates the soil improving its structure and creating spaces for increased microbial life. Keep in mind that even when used properly, the broadfork does have the potential to incorporate weed seed from below. This effect can be reduced by not overusing the tool and carefully opening the soil instead of flipping it. Regardless, it will activate some weeds.

After a couple of years, when the broadfork can sink into the beds with little to no resistance, it can be phased out. It served its purpose and can now be retired. Removing this step from your process when flipping beds will save you time and labor, and further reduce your weed pressure. It all revolves around the “disturb the soil as little as possible” principle of the no-till strategy.

Cultivation

Cultivation refers to lightly disturbing the surface of the soil to kill weeds or prevent weeds from growing.

On large-scale farms, there are cultivation attachments that mount to tractors and run up and down the beds to keep weeds under control. In a small-scale no-till farm (without tractors), cultivation tools are human-powered. This makes timely weed management practices more crucial. Low weed pressure equals lower stress for you, the farmer.

Josh uses small, lightweight tools to stay ahead of weeds. At the previous farm he managed, it took two people about 45 minutes once a week to cultivate a quarter acre in

full production. Establishing routine practices (proactive rather than reactive) will save you a tremendous amount of time.

Cultivation Tools

Josh used various cultivation tools over the years but reduced them to only a few.

Stirrup Hoe: Previously, in the tools module, the stirrup hoe was explained to be a great, long-handled tool to maintain pathways and cultivate around wide-spaced crops. There is a risk of damaging drip tape with the sharp blade; use it cautiously.

Collinear Hoe: The collinear hoe is also an excellent cultivation tool. It offers a little more precision than the stirrup hoe, but it still carries the risk of damaging drip tape or crops with its sharp blade. Unlike the stirrup hoe with an oscillating blade, the collinear hoe has a fixed blade that works well to break up soil that has crusted.

Flex Tine Weeder: Another popular cultivation tool for market gardeners is the flex tine weeder. This tool is essentially a rake with thin wire tines. It is designed to move around crops without damaging them, all the while disrupting tiny thread-stage weeds in the surface of the soil. It works best in looser soils and can accommodate small to mid-sized crops. There are cheap versions and very expensive versions on the market. Josh doesn't prefer to use them for his farm.

Flame Weeder: The flame weeder attaches to a standard propane tank you might use for a grill. There are also small models worn like a backpack. Flame weeders scorch small freshly germinated weeds prior to planting a crop. They're quick and very effective when the timing is right. Many growers plant crops like carrots, which can take up to two weeks to germinate, and then flame the beds a few days before the carrots germinate to kill any freshly germinated weed seed. Flame weeders can also help maintain clear pathways.

Earlier on, Josh used a flame weeder regularly in his system. However, as he started learning more about the no-till strategy and preparing the ground with tarps, he slowly phased it out.

The Wire Weeder: Currently, Josh's cultivation tool of choice is the wire weeder. This is a long-handled hoe with a triangular wire head. It works really well while moving around tight spaces. It has no sharp edges like some other cultivation tools, and it does not pose a risk of damaging drip tape or small seedlings.

Wire weeders come in different configurations. Josh prefers a triangle with a one-inch offset. This allows you to run it with the full width or on its side using the offset to get between really small spaces.

When weeds emerge in the thread stage, agitating the soil with a wire weeder prevents them from growing. This eliminates weeds from establishing and prevents the task of hand weeding. A regular pass with a wire weeder also prevents soil from crusting over the top. Wire weeders keep the soil aerated and healthy.

A wire weeder, or any other cultivation hoe, will always work better if you've taken the time to plant straight rows. Straight rows allow you to move much faster with decreased risk of hitting the plants. You can work upright with a long-handled hoe, which is much easier on the back. If done correctly, the task of cultivation can be a peaceful time to put on a podcast or music while you methodically work your way through all the beds. Once your crops grow together, this cultivation is no longer necessary; the plants themselves will shade out most of the remaining weeds.

Managing Weeds in Borders

Whether it's the borders around your caterpillar tunnels or the borders around open field blocks, keeping grass and weeds at bay is a must. If the bordering grass along your growing space is allowed to go to seed, the seed will be blown into your beds, causing an unwanted flush of new weeds.

Weed seed is always blown in to some degree, but maintaining your immediate borders significantly reduces it. The greater the buffer zone around your growing space, the better.

Josh has a 4-foot segment of landscape fabric around his caterpillar tunnels covering the drainage ditches. Beyond that are his hedgerows of beneficials to attract pollinators and insects that prey upon pests. These hedgerows are heavily mulched with wood chips at the base of the plants. The mulch provides another barrier against native grasses that would otherwise push in. Beyond that are natural grasses. In Josh's southern climate, these can get out of control fast. Mowing them and blocking them from creeping in is essential. Even using other barriers, if these grasses go to seed, they eventually find their way into the growing area.

When you mow around your caterpillar tunnels, first pull the sides of the tunnel down. Otherwise, the grass and seed that gets kicked up can get thrown into your beds. Another good preventative measure with the mower is a mulching cover rather than a side chute that throws the grass and seed out the side. This pushes the material back into the ground instead of making it airborne.

Managing Weeds in Walkways

Josh is a big proponent of using woodchips to maintain walkways. Placing woodchips in your walkways between the beds adds needed biological diversity to the soil by introducing fungal life. The chips form a protective barrier to suppress weeds too.

Pathways left as bare soil will constantly require weeding maintenance, typically with a wheel hoe or a stirrup hoe.

If you tarp a site long enough to kill all the weeds, then lay wood chips in the walkways, you create a low-maintenance, largely weed-free system.

Periodically add more woodchips to pathways as they break down over time. Josh finds this system is a better use of his time than the regular weeding of bare dirt walkways.

Weeds Gone Wild

Even when the best plans are made for a weed-free system, the reality is that most people experience out-of-control weeds at some point. It could happen in a specific section of the farm, or the whole farm could get out of control. Sometimes this happens while experimenting with new practices or when an area is neglected because other tasks and distractions have prevailed.

Covering Individual Beds: When this happens, there are strategies to help get back on track. One such technique that Josh uses is laying a strip of landscape fabric over a bed with out-of-control weeds. Before covering, he hand-pulls or cuts down the weeds in the bed. After this step, a piece of landscape fabric or even a remnant of silage tarp (if you have some) can cover the bed. Weigh down the sides with sandbags and leave it covered until all vegetation is entirely dead.

It's also important to relieve beds from having every single one in production at all times. If a bed or two was overtaken by weeds, cover it, let it rest, and focus on other farm tasks that need to be addressed.

Scaling Up Too Quickly: A common scenario in which weeds can get out of control is when a farm expands too quickly. It's common for farmers to get really excited after having some success on a small plot. This excitement leads to jumping into "let's build more beds!" Intentionally keeping the farm small for a while, and focusing on your weed management systems, can prevent unnecessary stress.

Planting Into Landscape Fabric: Planting into landscape fabric is a good solution when you need to produce a crop quickly and can't afford the time to kill weeds under a silage tarp. When Josh was managing Raleigh City Farm, he didn't get a chance to tarp inside one of their tunnels and had to start planting immediately. When summer came around, they had heavy weed pressure. By laying down landscape fabric directly over the beds and planting cucumbers and peppers through holes in the fabric, they were able to get a good crop from the tunnel still. Landscape fabric keeps moisture in the ground, keeps soil biology happy, and smothers weeds with deprivation of light.

Planting into landscape fabric is a good option for tillage farms attempting to convert to no-till. The only drawback is that it requires all transplanting and eliminates your ability to direct sow seeds in the field. Still, it's a great approach when transitioning to the no-till deep compost mulch system.

Conclusion

Time spent weeding when those weeds could have been prevented is time wasted— this ultimately cuts into your bottom line. You'll be more profitable and a lot happier incorporating the no-till strategies on your farm: 1) keep the soil covered, 2) keep the soil planted, 3) disturb the soil as little as possible, and 4) create diversity whenever it's possible. Implement a solid weed management strategy from the start, and you'll allow yourself to spend more time growing and selling your vegetables and doing other activities you enjoy!