Summer 2016 Weeding Protocol Development

Introduction:

Western Michigan University’s Gibbs House has served as a site for research and development for students interested in sustainability for nearly 10 years, and retaining the visual integrity of the property for community members who drive by or visit the site requires a more structured commitment from the entire permaculture team. Maintaining the aesthetics of the Gibbs property is at the forefront of the permaculture team’s list of priorities, necessitating the need for a more effective and efficient method of weed removal and disposal. While currently having no formal weed management protocol in place, the development of the following generalized procedure will help guide permaculture team members to the most effective and “painless” form of weed management possible. With this need in mind, a 7-header complete approach to weeding on the property has been developed and is followed by additional commentary on thistle management.

Procedures & Results:

Weeding in newly seeded rows before germination is imperative to the well-being of the crop. Once a row has been seeded, a concerted effort to weed between the seeds must be made. This type of weeding must be done by hand and with care not to disturb the seed. This must be regularly done until the seeds have germinated to an appropriate size to be straw mulched.

Weeding in rows filled with weeds under 4” is most effectively carried out under dry soil conditions. With dry, loose soil, a scuffle or stirrup hoe can be used to quickly remove weeds within a row (Figure A). Caution must be made with this tool as to not attempt to remove weeds between individual plants, which can cause unintentional damage to the crop. Therefore, between plants of any stage and size, weeds must be hand-pulled. Under wet soil conditions, the scuffle hoe cannot operate optimally, and all weeds must, therefore, be hand-pulled.

Weeding in rows filled with weeds over 4” must be done by hand with the aid of a digging fork for tap roots found in some weeds such as dock weed, wild carrot, and dandelion (Figure D). Caution must be made when using the digging fork as to not uproot any crop, especially root vegetables. In some cases, weeds may be too large to pull without disrupting a nearby plant. In cases such as this, the large weed should be immediately cut back and later removed once the plant is removed. Gathering a large team to carry out this procedure all at once provides the most painless and time-efficient result. Once weeding of a row is completed, a thick straw mulch layer (6”-8”) must be added (Figure B). Take heed when applying straw as to not choke out the existing crop. By creating small “nests” around each plant, the growth of a
healthy, happy plant is facilitated (Figure C). Another method in removing large weeds that has been tested with great success is a mow-first technique in which a lawnmower or stringtrimmer is brought in to remove the tops of certain weeds. After mowing, allowing the weed to sit in the heat for a few hours weakens the plant and allows for a much easier removal. This method was used with great success with mint, whose roots are notoriously frustrating to remove. NOTE: Initially, a seeding-first method was used, in which weed-filled rows were managed on an emergency basis by removing only weeds that has either gone to seed or gone to flower. After using this method for some time, it was noted that this was merely “treading water”, as new weeds would be going to seed or flower every week, and the rows never changed in appearance (Figure F). Therefore, this seeding-first method is only recommended when there is no other means to weed and straw mulch the entire row, as straw mulching after a full row weed pull is the most effective means to prevent the immediate regrowth of weeds (Figure G).

Maintaining straw mulched rows is much more time-efficient than maintaining unmulched rows. When weeds begin to appear through the thick layer of mulch, removing them by hand is a simple task. Following the disposal of the weeds, remulching the row with straw is necessary to ensure a complete smothering of the weeds below.

Weeding in pathways between rows is best carried out simultaneously with row weeding. When straw mulch is applied to the row, mulching 6” into the path helps maintain the integrity of the paths. Weeding tractor pathways and wood-mulched areas within the east field is a daunting task, as weeds seemingly pop up immediately after the paths have been cleared. One method that was used with great success this summer was the cardboard + wood mulch method, which was used along the north side path of hoop house 1. With this method, cardboard boxes were deconstructed and placed along the path, ensuring that boxes overlapped to provide maximal sunlight blockage. Once the cardboard was appropriately placed, tractor-assistance was used to bring large quantities of wood chip mulch on top of the boxes which was spread evenly over the surfaces using 14” garden rakes. This cardboard + wood mulch method appears to be the most effective way in managing weeds in large pathways, and an effort to apply this method to all pathway areas would be wise.

Weed disposal is an area in which many methods were tested and thrown out. After weeds are collected in a wheelbarrow, they are to be added to the pile of weeds behind the three bin composting system outside the parameters of the fence. NOTE: Initially, weeds were added directly to the active pile of compost, in which they began to root and thrive. To prevent this, a chipper was purchased to shred previously solarized weeds to add them to the active pile. However, this method was extremely time-consuming, and with the chipper/shredder needing continual maintenance, the current method was developed.

Weed control through cover cropping is a method added to the east field’s protocol just this summer. Upon finding that weed management was a task that was continually being left incomplete, the decision to remove crops and weeds from some rows of field 2 and replace them with a mix of wild oats, field turnips, and clover was made (Figure E). By rotating which rows are cover cropped each year, prevention of over-stretching the soil is established in conjunction with the addition of nutrient-rich biomass to the soil and the lessening of the burden of weeding.
Thistle has proved to be an interesting topic of debate on the Gibbs property. Farm manager Daniel Bair reminds us that every farmer has an opinion formulated on the best way to manage thistle. Thistle, regardless of size, forms sideways chutes that are not easily uprooted. Therefore, some farmers hold to the idea that a digging fork is the most appropriate means of thistle removal on a property. Others have found that hand pulling thistle is equally as effective. My observations on the Gibbs property have found that regardless of the method of removal, thistle tends to reappear in a straw-mulched bed approximately one week after being pulled. With this in mind, the simpler hand-pull method may be the most time-efficient method in managing the weed.

Commentary and Reflection:

With weeding at the forefront of priorities on the Gibbs property, many different methods have been tested to create the most efficient system of weed management. It is only through trial and error that new and improved methods are developed. This summer, the initiation of a weekly Friday morning team project has showed great promise for the permaculture team. Typically focusing on weeding, it is through these mandatory group efforts that the most progress can be seen. While working on a project, a dialogue is formed between team members that includes education and collaboration. Therefore, a continuation of these weekly sessions is of the utmost of importance if new or revised weeding methods are to continue.

Next Steps:

Designating a day in which the tractor pathway can be weeded using the cardboard + wood mulch method would provide the property with an immediate visual improvement. Monitoring the stock of straw mulch and requesting more before the quantity runs out is a simple measure to prevent tedious weeding without a mulch barrier. Finally, a follow-up at the end of the fall season to see how the use of a single protocol, specifically highlighting the use of cover cropping in the east field, withstood consistent usage would definitively support or refute the efficacy of the methods outlined.
A scuffle hoe is used to remove a small weed

A nest is formed around a plant that has been heavily mulched

6in-8in straw mulch should be applied

A digging fork is used to remove large weeds

Rows in field 2 were seeded with cover crops

Hugel that has been managed through seed-first

Field 3 that has been managed through a series of complete pulls