

# Introduction to Weed Management in Gardens

Learn about the different strategies to manage weeds in your garden!



## Introduction to Weed Management



Figure 1: Weeds in a raised bed. (Source: <http://smg.photobucket.com/user/baillan/media/sept4-5-B-after.jpg.html>)

Managing weeds in the garden is arguable the most time consuming and frustrating chore of the garden. Weeds, or, anything you would prefer not to grow in your garden, have highly developed strategies for survival making them difficult to manage. In response, many farmers and gardeners have developed highly intelligent strategies to eliminate weeds with the goal, or hope, to reduce labor costs, increase harvest yield, and/or to maintain aesthetic or cultural preferences. In fact, some companies earn millions of dollars doing just that.

Some weeds, like Dandelion or common purslane, are edible and valuable toward supplying your dietary needs free of charge! However, if you are not open to eating your weeds as some are, this document aims to offer some strategies and ways-of-thinking to help you manage weeds in your garden.

## How Weeds Survive

All of life is about creating more life. Each plant and animal, therefore, has a unique way to insure it or its offspring can thrive even during times of stress (e.g. droughts or weed pulling). Some plants, for example, have seeds that are viable for many years down the road. Other weeds, like quack grass, hold nutrients in their rhizome roots so that they can continue to grow even after

being “killed” through pulling or chemical methods.

Because each weed has a unique survival tactic, the main strategy to manage many weeds at one time for many gardeners is to employ suppression methods of management.

## Weed Suppression

Weed suppression employs techniques or strategies that are burdensome to the weed(s) so that the cost of survival for the weed(s) is greater than the cost of termination. In essence, the gardener who wishes to manage weeds is controlling the weeds biological needs (i.e. nutrients, photosynthesis, etc.).

## Weed Suppression Methods

Often, weed management and suppression within the garden includes a combination of methods. The management strategy of choice depends on:

- cost,
- available time and labor,
- size of garden, and
- types and amount of weeds.

For any weed suppression strategy to be effective, these values must be considered:

- Persistence
- Knowledge of the weeds you are suppressing
- Consideration of your crops and their needs

Below are common weed suppression methods used in vegetable gardens.

## Mulching or Smothering

Mulching methods of weed suppression creates a situation where, ultimately, the weed is deprived of sunlight and/or space, for extended periods. This forces the weed to use its reserves for regrowth, to go dormant, or to terminate entirely.

There are four types of mulching or smothering weed management strategies; organic mulching,

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inorganic mulching, shading, and cover cropping.

## Organic Mulches



Figure 2: Leaf Mulch and Leaf Mold makes an excellent mulch to suppress weeds and adds valuable organic matter to your soil. (Source: [https://i.ytimg.com/vi/iuU9q\\_6GJVM/maxresdefault.jpg](https://i.ytimg.com/vi/iuU9q_6GJVM/maxresdefault.jpg))

Organic mulches such as leaf litter or mold, wood chips, straw, newspaper, cover crop residue, etc.

Advantages include adding organic matter to your soil while allowing moisture to infiltrate but limiting evaporation. This is especially helpful in raised garden beds. The degree of success varies with cover crop use and residue being highly effective to newspaper being less. Organic mulches are typically free to very inexpensive.

Disadvantages vary depending on the organic mulch used. Wood mulch, for example, is effective at suppressing weeds. However, it tends to bind up needed nitrogen for your plants as it decays. Straw is effective but can sometimes have its own seeds sprout in your garden.

A more in-depth look at organic mulches is offered by the HCSWCD or online at [www.hamiltonswcd.org](http://www.hamiltonswcd.org).

## Technical Assistance

Contact the Hamilton County Soil and Water Conservation District to schedule a site visit and learn more about which weed management plan is best for you!

## Inorganic mulches



Figure 3: A porous landscape fabric is used here to help suppress weeds. (Source: [http://diy.sndimg.com/content/dam/images/diy/fullset/2010/12/16/1/RX-DK-VGN10803\\_sheet-mulch\\_s3x4.jpg.rend.hgtvcom.966.1288.jpeg](http://diy.sndimg.com/content/dam/images/diy/fullset/2010/12/16/1/RX-DK-VGN10803_sheet-mulch_s3x4.jpg.rend.hgtvcom.966.1288.jpeg))

Inorganic mulches include the use of an opaque synthetic material such as landscaping fabric or black plastic, to completely block sunlight from reaching the plant and create an impenetrable barrier for the weed to sprout.

Advantages of inorganic mulch or offered through its impenetrability. Depending on the material you use, though, this can limit water from watering your plants. Some materials act

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like an organic mulch, by letting moisture in and limiting evaporation. The main disadvantage, however, is cost; the more elaborate the material, the more expensive. It can also create unnecessary waste.

## Shading

Shading creates a dense canopy or shade with vegetable crops, or cover crops, to limit sunlight from reaching the ground beneath or to crowd out space for weeds to grow with more competitive and beneficial vegetation.

With good soil, the advantages can mean increased yield. Disadvantages might include increased disease or soil pathogens. A health crop rotation plan should be utilized with shading as a method of weed suppression. In order to achieve the affect, however, a systematic weed management should be implemented prior to the vegetables reaching a mature size.

## Cover Crops



Figure 4: Cover crops in raised bed. (Source: [http://readiness-plan.com/wp-content/uploads/2015/06/how-fix-soil-cover-crop\\_1b88e964c5b8b68e8d9801ee86a7707e\\_1\\_3x2\\_jpg\\_300x200\\_q85.jpg](http://readiness-plan.com/wp-content/uploads/2015/06/how-fix-soil-cover-crop_1b88e964c5b8b68e8d9801ee86a7707e_1_3x2_jpg_300x200_q85.jpg))

Cover crops, like rye, oats, clover, and hairy vetch, offer the benefits of organic mulching, chemical control (allelopathy) in certain circumstances, and smothering all in one. In addition to this, a mix of cover crops can add nutrients like nitrogen as well as organic matter,

planted in the fall after your harvests or between crops during the spring, summer, and fall. The advantage is that it is an inexpensive, all in one, solution to weed suppression, adding nutrients and organic matter, and providing space for habitat. Cover crops have been shown to decrease the density and prevalence of tough-to-manage invasive weeds like Canadian Thistle and Quack Grass with Cereal Rye. It also helps to prevent erosion.

Disadvantages include the additional complexity, though minimal for the advantages, of adding more crops to your rotation. Certain cover crops, if not understood, can limit the growth of certain vegetables the following year. A well thought out planting and crop rotation plan is needed if cover crops are to be used effectively.

## Solarization



Figure 5: Solarization of garden bed using clear, UV resistant, plastic. (Source: <http://growmakegive.com/wp-content/uploads/2012/07/solarizing-soil.jpg>)

Using a clear plastic or glass on top of the area in need of weed suppression to increase the heat to temperatures where the seed or weed cannot survive.

Weed solarization is similar to soil solarization in that it is, "an environmentally friendly method of using solar power for controlling pests such as soil borne plant pathogens...along with weed seed and seedlings in the soil by mulching the soil and covering it with tarp, usually with a

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transparent polyethylene cover, to trap solar energy...[this] energy causes physical, chemical, and biological changes in the soil." [1]

The advantages of this are great. Solarization can establish an area, essentially, weed free for a generous amount of time. It can also achieve elimination, albeit temporary, of troublesome invasive weeds like Quack Grass and/or Canadian Thistle. The disadvantage for many gardeners is the amount of time needed to achieve the affect. Often, solarization must take place throughout the entire growing season requiring the gardener to give a portion or the entire garden up to fallow. In addition to this, solarization may change the soil chemistry in a way that is not advantageous for vegetable growth. The advantages of solarization in highly infested garden usually far outweigh the disadvantages.

## Mechanical

Mechanical forms of weed suppression aim to remove the weed, and therefore, suppress its ability, to thrive in the garden space. This is an inexpensive method but time consuming. For large gardens, with a few exceptions, mechanical forms of weed management may not be suitable due to large investments of time.

Listed below are some common forms of mechanical weed management.

## Pulling

Pulling is the tried and true method of management weeds. This is successful for fairly weed free and small gardens. However, for larger gardens, or heavily infested gardens, this can be time consuming. In addition to this, pulling is completed usually while on your hands or knees, limiting some who have physical restraints. Weed pulling with small tools, such as weed puller, can be beneficial and effective on most weeds. Some weeds, however, are nearly impossible to manage well with pulling alone.

## Hoeing

Hoeing includes the use of various tools (and there as many tools for hoeing as there are gardeners) to uproot or disturb the weed bed. Like pulling, this is a labor-intensive method but with persistence, is effective at managing weeds.

## Tilling

Tilling is an effective method in both the spring and fall, in managing weeds. For certain weeds, an intensive tilling strategy can eliminate invasive species that tend to linger but would require putting your infected bed in fallow at least until the late summer. If your garden has plenty of space between rows, a small tiller can easily maintain the bulk of them.

Tilling, however, can disturb attempts to build organic and nutrient matter into the soil despite its initial benefits of increasing soil porosity and drainage and releasing nutrients and microbes for plant health among other benefits.

## Flaming



Figure 6: Using a flamer, like a Weed Dragon, to eliminate weeds. (Source: <http://2.bp.blogspot.com/-b7Cvpp8lab4/TsyFq5WgAJI/AAAAAAAAAIA/2Yq4sNseTr0/s1600/torching+weeds.JPG>)

"Flamers are portable gas torches that produce intense heat (about 2,000°F). When you pass the flame over and around weeds, it quickly boils the water in the plants' cells, causing them to burst. Once the heat destroys any section of a weed's

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stem, for instance, water and nutrients cannot reach the leaves, and the top part of the weed dies." [2] With persistent use, this can be a valuable tool for weed management. It can even help eradicate some persistent invasive weeds without going into fallow. Be careful, however, as the heat can also damage your vegetables!

Read more about flamers here:

<https://garden.org/learn/articles/view/77/>

## Chemical

### Allelopathy

"Allelopathy is a biological phenomenon by which an organism produces one or more biochemicals that influence the germination, growth, survival, and reproduction of other organisms. These biochemicals are known as allelochemicals and can have beneficial (positive allelopathy) or detrimental (negative allelopathy) effects on the target organisms and the community." [3]

There are numerous ways that allelopathy can be used to help suppress weeds in your garden. The use of certain varieties of cover crops such as Rye, for example, can help.

The use of allelopathy requires an increased knowledge of the relationships of plants and can increase the complexity of your planting plan but the hard work up front can save lots of time and effort in the future.

### Herbicides

Herbicides are typically synthetic chemicals that inhibit and, with usual weeds, terminate the plant entirely. There are too many herbicides available to gardeners to mention here. However, there are many types of herbicides available to gardeners who wish to be accurate with their application. The advantages of herbicides are

their effectiveness and ease of use. The disadvantage is that, if used incorrectly, can kill your vegetables, or create other weed issues like adaptation in the years ahead. Herbicides are not considered organic unless otherwise noted on the label. [4]

## Other Chemical Methods

Organic herbicides like vinegar or clove oil [5] in varying concentrations and mixes have been shown to be effective on many weeds. Commercially available organic herbicides are also available at your local plant nursery.

### Vinegar Herbicides

Additionally, some knowledgeable gardeners create their own homemade versions of herbicides with household chemicals like dish soap, vinegar, and sodium chloride (table salt). According to an experiment hosted by the Cornell Cooperative Extension of Rensselaer County in New York, the application of vinegar in 5% or 20% applications compared to other popular name brand synthetic herbicides were nearly comparable. Anecdotal evidence does not suggest changes in soil chemistry with this particular application. [6] Likewise, herbicides using vinegar will not kill the root of the weed.

## Weed Management in Preparation for Winter

An often-missed opportunity for gardeners is managing weeds after the final harvests have been made. Weeds like Ground Ivy, Chickweed, and others, tend to stick around for the winter. Employing any of the weed management strategies above to limit their winter reserves will insure a less resources allocated to weed management the following spring.

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## Additional Recourses

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### Allelopathic Weed Suppression Through the Use of Cover Crops

USDA and Auburn University

[https://www.ars.usda.gov/ARUserFiles/60100500/csr/ResearchPubs/price/price\\_12c.pdf](https://www.ars.usda.gov/ARUserFiles/60100500/csr/ResearchPubs/price/price_12c.pdf)

### Current Substances for Organic Weed Control in Vegetables or What Do We Have In Our Organic Weed Control Toolbox

<http://www.sustainagga.org/documents/flameweeding236313-WEBBER.pdf>

### Managing Weeds in the Garden. Table. Community./Mother Hubbard's Cupboard

<https://drive.google.com/file/d/0B4s4XpORNGLVNzkzZGISZ1g2TXc/view>

### Organic Weed Control

Organic Growers School

<http://organicgrowersschool.org/for-gardeners/organic-weed-control/>

### Weed Control in Vegetable Gardens

North Carolina Cooperative Extension Service

<https://content.ces.ncsu.edu/weed-control-in-vegetable-gardens>

## References

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- [5] C. Webber, J. Shrefler, L. Brandenberger, W. Johnson, A. Davis, M. Tayler and R. Boydston, "Current Substances for Organic Weed Control In Vegetables or What Do We Have In Our Organic Weed Control Tool Box," in *Horticulture Industry Conference*, Ft. Smith, Arizona, 2009.
- [6] Mary Hunt's Everyday Cheapskate, "Hands Down the Best Way to Kill Weeds and It's Not Roundup," 5 July 2016. [Online]. Available: <http://www.everydaycheapskate.com/home-and-family/hands-down-the-best-way-to-kill-weeds-and-its-not-roundup/>. [Accessed 6 January 2017].