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How Much Do You Mulch?

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The virtues of mulch are well known by most organic gardeners. A good mulch can smother weeds, conserve moisture and improve soil. This paper will focus on the tricks, the headaches, the possibilities, and the pitfalls of using mulch in the garden. There are both good and bad ways to use mulch. I have rounded up several helpful "good way" tips, all of which work -- for somebody. The real point, though, is that it's up to you to figure out which mulching techniques will work best in your plot. Be open-minded. Experiment. Then judge the results and decide for yourself.

Inorganic Mulches

Organic gardening, organic mulches, right? Not necessarily. A lot of gardeners of all persuasions are covering their ground with plastic. In fact, we may be about to experience an explosion of synthetic mulches.

The old standby is black plastic, polyethylene. Unroll it down a row, cut slits, stick in plants, and wait for harvest. That's the idea. Of course, the operation's a tad more complicated than that. You'll want your soil fully worked up, fertilized, and weeded first. It needs to be good and moist, since rain doesn't fall through plastic. And you'll need to weight down the sides of the plastic with dirt, stones, or whatever to keep it from blowing away.

Since black plastic absorbs heat, it can help you get a head start on heat-loving vegetables: farmers often use it for pepper and melon crops, especially in short-season areas. An unexpected side benefit is that it can help block soilborne disease. Early tomato blight, for instance, is the bane of organic tomato growing in these parts (the mountains of western North Carolina). More than one tomato gardener I know has found that using black plastic to eliminate soil splash helps ward off the blackness of blight.

Perhaps surprisingly, clear plastic warms soil more than black -- as much as 20 F instead of 3 or 4. This is because the clear poly transmits heat while the black poly absorbs it. The problem there, of course, is that weeds love to grow under clear

plastic. So practically no one uses clear plastic for mulch. Recently, though, scientists have been trying to combine the virtues of the two common plastics. The result? Infrared transmitting (IRT) mulch. It lets through infrared light (which produces heat) but blocks photosynthesis-producing light (so no weed growth). One researcher, Brent Loy of the University of New Hampshire, Durham Plant Biology Department, has almost doubled early melon yields and boosted total melon yields 30 percent (over black plastic-mulched crops) by using a version called IRT-76.

Along similar lines is a whole new array of landscape fabrics, or geotextiles: fibrous mats that let water and air through but block most weeds. (some brand names are Miracle Mulch, Weed-X, Weed Barrier, Earth Blanket, Weed Block, and Weed Mat.) Frequently, ornamental gardeners will lay a geotextile around their plantings, then cover the material with an attractive organic mulch like cedar chips or pine bark. The result is very good weed control and a better, more natural-looking surface appearance.

There's more. Some commercial growers use aluminized mulches. These reflective covers confuse aphids (which often carry plant viruses). In various field tests, the covers have doubled yields of squash melons, and cucurbits -- crops frequently plagued by aphid-carried disease. They've also reduced thrip infestation, markedly improving tomato and pepper yields (both crops are susceptible to thrip-carried tomato wilt spotted virus). There is even a new shiny gray and black mulch that combines the repellent quality of aluminized mulch with the heat-retaining capability of black mulch. (Home gardeners can simulate such materials fairly well with aluminum foil and black plastic.)

This is just the beginning. Designer mulches are on the way. The hot research trend today is color. Red mulch, for instance, boosts tomato and bell pepper yields. Orange mulch repels the sweet potato whitefly. There are indications that certain mulch colors may affect leaf protein, flavor, or different stages of growth.

At this point, the color-mulch research looks a if it will have more usefulness for farmers than gardeners. For one thing, you can't duplicate it at home. Two shades of red that look identical to the human eye might be "seen" completely differently by plants. Plus, tailoring a separate mulch for every crop is a lot of trouble for home-sized gardens.

Organic gardeners often have other reasons for limiting their use of plastic mulches. For one thing, let's face it" plastic is ugly. A lot of ornamental growers get around this by covering their plastic mulches with organic material. This looks much better and does a great job of blocking weeds. But the plastic barrier works both ways. Not only does it help keep weeds from getting up to the light, it stops the organic mulch from reaching - and improving -the soil.

Plastic mulches encourage shallow root growth, making trees and shrubs more susceptible to drought and wind damage. If the material doesn't "breathe," it can also promote root disease or a lack of oxygen at ground level.

But probably the worst problem of all is disposal. Plastic mulches eventually start to break apart from sunlight. When that happens, you have to trash them, and the longer you wait the more brittle - and harder to deal with - they become. And there's nothing that feels less like wholesome enjoyable gardening than rounding up mounds of filthy, deteriorating plastic to throw away. Of course, ever helpful manufacturers have tried to solve that problem by developing "biodegradable" plastic mulches. But guess what? They aren't. According to research at Cornell University, they break up, not down. They lose strength, but not material. So you're really left with millions of tiny pieces of plastic in you soil.

There are, however, at least a couple of manufactured mulches, Hortopaper and Planters Paper, that seems to be made of natural materials. Thus they should degrade naturally into benign soil-building components.

Organic Mulches

I prefer organic mulches to inorganic. They help build the soil instead of merely hiding it. They recycle yard waste and other organic materials that might otherwise end up in a landfill. And they are attractive; they make you feel like you're gardening, not, sterilizing.

While the good uses for organic mulches are many, there are a few drawbacks. These include:

1. *Slugs*. Yes, those varmints like to hole up under a nice, cool, moist layer of mulch. So do their kissing kin, snails. Earwigs and pill bugs, as well, may multiply under mulch. It can work both ways though. A Tennessee researcher found a dramatic increase in spiders and from 60 - 70 percent less plant damage when she compared mulched first-year gardens to unmulched ones.

Another scientist, at Virginia Polytechnic Institute, observed that a good layer of wheat straw or grass hay around potato plants reduced damage from Colorado potato beetles.

In other words, an organic mulch can encourage beneficial insects and create a physical barrier for some pests. It's up to you then to observe what happens when you mulch various crops and to judge whether the overall effect is positive or negative.

2. *Weeds*. If the mulch you use has a lot of weed seeds in it, spreading it around you garden will also be sowing some wonderful future crops of weeds. So you'd be wise to discriminate in your choice of mulch. Avoid seedy grass clippings, for instance (nonseedy are fine of course). Be cautious with hay. Since many meadow grasses go to seed early in the growing season, first-cut hay is more likely to weed-seedy than later cuttings. Straw, which in hay after the grain has been removed, is also likely to be low on weed seeds. And late-season alfalfa, if you can get it, is ideal. It's not only low on weed seeds but loaded with nitrogen.

3. *Sourness*. Don't make the mistake of using sour mulch, mulch that has fermented anaerobically instead of composting properly. Sour mulch can have a pH as low as 1.8 to 3.6 while normal mulch rings in at between 6.0 and 7.2, much closer to neutral. The sour types can contain plant toxins such as methane, alcohol, ammonia, and hydrogen sulfide. Hardwood bark, sawdust, and yes, silage are good candidates for souring.

However, it's easy to avoid this problem, because sour mulch smells sour. If you turn a forkful of your mulch over and get a whiff of ammonia, vinegar, or sulfur, don't use that stuff until you wither compost it properly or spread it out awhile, so the toxic gasses can dissipate.

There are a few similar mulch problems to watch out for. If you use wood-chip mulch with a lot of black walnut in it, you'll be spreading jugalone, a growth inhibitor black walnuts make to reduce competition. Some kinds of fresh, raw leaves contain growth-inhibiting phenols that are particularly harmful to brassicas. And fresh grass clippings can "burn" tender seedlings if the grass is piled up too close to the plants.

4. *Too cool.* Organic mulches shade and cool the soil. This insulating effect is great in summer, but can slow growth, particularly of heat-loving crops, in spring. Don't mulch such heat-loving crops as tomatoes until after the soil warms up, say a good four weeks after transplanting.

Use common sense and be observant, and the vast majority of your mulching experiences should be positive ones. What follows is a gazette's worth of mulching suggestions.

Raspberries - I'm sure cardboard mulch works well for raspberries. Well, Cornell University researchers more than agree with me. They found that straw-mulched raspberries bore almost twice as many berries as ones where weeds were controlled by black plastic mulch, herbicides, or hand-weeding. They credited the dramatic difference to "improved soil moisture status under the mulch, and the fact that root systems were undisturbed."

Asparagus - You harvest asparagus only in the spring; why weed it all year? After that last harvest, weed the bed thoroughly, then mulch it heavily with clean hay or straw. Next spring, pull the mulch back so tender young spears can grow unblocked. (Want to experiment with a variation? Sow annual ryegrass seed thickly in the bed after the last spring weeding. It will choke out most weeds that try to sprout, then will die over winter.)

By the way, if you have problems with asparagus beetles, clear off all the old mulch and old plants after frost and remulch with new material in the spring. That should get rid of over-wintering adults and larvae. (You might want to then cover your bed with a floating row cover until harvest, to keep any returning beetles from getting your crop.)

Strawberries - Mulch and perennial crops go hand in hand. A four- to -six-inch layer of weed-free mulch will save you the effort of weeding your strawberries over and over all summer.

Potatoes - Some folks don't even plant their potatoes. They lay them on the prepared surface of the garden, then cover them with a good foot or

more of hay. The vines sprout through the mulch. They need no weeding. And you can harvest your crop without even digging. I'm not sure if this method produces as big a harvest, so if you try it, plant some potatoes the regular way and either hill or mulch those plantings -- then compare yields.

Corn - One it's knee-high, mulch. That way you won't disturb the plants or their roots or compact the soil during the most important stages of growth.

Beets - If your beets get leafy spot, mulch. The disease spreads through soil splash.

Cabbage - Got a problem with cabbage root maggots? You might mulch around the base of the young plants with an inch or two of sawdust to keep the fly from getting a chance to lay eggs. (Most people don't mulch large sections of gardens with sawdust. It's acidic and uses up nitrogen. But you can use it in circles around plants.

Tomatoes - Do you have a problem with fruit cracking or with blossom-end rot? Both of these are frequently a reaction to water stress. A good layer of mulch can help keep the soil moisture levels even.

Seedlings - Some gardeners mulch even their seedbeds with a very shallow-say, half-inch-layer of light mulch. This helps keep the soil constantly moist, a crucial condition for seed germination.

Living mulch - You can grow lettuce (or clover) under taller crops to provide the benefits of mulch and give you a harvest (or build the soil) at the same time.

Grow your own mulch -- Put idle areas of your garden to work. Plant an annual cover crop like rye during the growing season, or winter wheat or winter rye in the fall. Cut it down before it goes to seed, for your next supply of mulch.

At the USDA agricultural lab in Beltsville, Maryland, researchers planted a summer crop of hairy vetch, let it overwinter, then mowed it down the next spring and transplanted tomatoes directly into the site. The cut vetch plants died and formed a weed-blocking mulch around the tomatoes. The result? A yield increase of 138 percent and no Colorado potato beetle problems.

Leaf mulch -- Leaves can make fine mulch, but they tend to mat unless they are chopped first. To chop, you can mow right over them. If you have a grass-catcher bag, great. If not, just mow in a pattern that pushes the leaves together. Or put

them in a larger garbage can and use a string trimmer. This works best with dry leaves.

Newspaper -- Are newspapers safe to use for garden mulch? The final word isn't in, but the general consensus for now seems to be black-and-white, yea, color, nay. Some black-and-white papers that have been tested contained negligible amounts of heavy metals. But a USDA soil scientist has discovered harmful metals in four-color advertising inserts; barium in red ink, copper in blue and green, and manganese, cobalt, and lead in metallic inks.

Trees and shrubs -- Mulch provides an extra, important service around trees and shrubs: it protects them from mower or trimmer injury! Such injuries can lead to insect or disease infestation and are sometimes considered the single most common cause of tree decline. A good tree-protecting mulch is about three to four inches deep and at least two feet in radius. Keep it two to four inches from the trunk itself to reduce rot and mice problems.

Winter protection -- Many ornamental plantings - including bulbs, perennials, and small shrubs and trees -- aren't bothered by the cold of winter. It's the soil heaving caused by repeated freezing and thawing that can disturb their root or send them a too-soon grow signal. To prevent that, lay a thick layer of mulch over the plants after the top two inches of ground have frozen hard. (If you put it on too early, mice may move under the mulch and nibble the bark of the plants you're trying to protect!) You can then pull this back in the spring so the soil can warm up for your bulbs and perennials.

Ornamental mulches -- Many ornamental growers mulch all the plantings they can. Probably the most popular mulches for this are pine bark, hardwood bark, cedar chips, longleaf pine needles, and shortleaf pine needles. Of those five, pine bark and longleaf pine needles last the longest, according to tests done at North Carolina State University. But all will need occasional replenishment.

How thick? -- The denser the mulch, the thinner you should lay it. Thick materials such as buckwheat hulls or sawdust need to be only an inch or two. Bark will work fine at two or three inches of thickness. Hay, though, is so loose you could probably use six inches of it. Don't put any mulch on too thickly or it may block water and oxygen from getting to the soil.

Nitrogen shortage? -- When carbonaceous material breaks down, it temporarily uses up extra nitrogen. If you apply a C-heavy mulch like fresh sawdust in your garden scratch some bonemeal or other nitrogenous fertilizer on the site first.

The Queen of Mulch

It would be unfair to "leaf" this topic without briefly mentioning the boldest mulch experimenter of all, Ruth Stout. Although she died in 1980, she still stands as the Queen of Mulch, because she decided to entirely quit tilling and digging her Connecticut garden and instead covered the whole thing with eight inches of mulch.

Stout would pull the mulch back to plant her seeds. She'd immediately cover larger seeds with an inch or two of hay. Smaller ones might or might not get a little covering; either way, she pulled mulch right up to the plants when they germinated. She'd throw onion sets and potato pieces directly onto the old mulch and cover it with new. She'd even use hay to prop up her pea plants!

Stout claimed to get good yields -- and certainly didn't have to work hard to get them! (She titled one of her seven books, The Ruth Stout No-Work Gardening Book.) If you're feeling bold, grab one of her books and try her methods. It may work great for you and if it does, gardening is suddenly going to become a lot easier. It should be noted that Stout had gardened on the site for years, so the soil already had good fertility. I wouldn't recommend all-mulch gardening on a new site. It would be years before enough mulch had decayed to really build up the quality of the soil.

OK, if these are not enough ideas to get you going with mulch, then you're just not the mulching type. I hope that's not true. There are just too many benefits from mulching to pass it up. As far as I'm concerned, it should definitely be one of your gardening techniques. Just use it with an open mind and common sense, and both you and your plants should be richer for it.

Some Sources for High Tech Mulches

GARDENER'S SUPPLY COMPANY 128 Intervale Rd. Burlington, VT 05401 (Miracle Mulch, Hortopaper, IRT-76, Weed Mat)

GARDEN'S ALIVE! 5100 Schenley Place, Lawrenceburg, IN 47025 (Weed Barrier)

BOUNTIFUL GARDENS, 18001 Shafer Ranch Rd. Willits, CA 95490 (Planter's Paper)