

# The Vancouver Permaculture Network

## Healing Urban Soils with Sheet Mulching

It's springtime and time to dig the garden! Or is it? While digging the garden is a good workout and a time-honored tradition, it's not necessarily the best thing to do from the soil's point of view. This is particularly true when it comes to soils that have been degraded through the activities of human beings, especially in urban areas.

The soil found in vacant lots and city backyards is often compacted, devoid of organic matter and life. In fact, when people started gardening the old dump site that became Cottonwood Community Gardens, the stuff that they encountered could scarcely be called 'soil' at all. In many places it was a dead mixture of compacted sand, clay and building rubble. Worms were almost non-existent and even the weeds weren't thriving.

One of the best techniques for healing such beat-up, injured soils is the sheet mulch. Sheet mulching copies the way in which forests continuously preserve and enrich their own soils.

No one comes along to plow, weed or fertilize the soil in a forest, yet its trees can keep on growing for hundreds of years and the forest itself can last thousands. This is because organic matter is continuously recycled from the trees to the forest floor and back again. Leaves and branches drop down from the canopy to the forest floor forming a natural mulch which is gradually broken down by the microorganisms living in it, becoming humus. These insects, worms, bacteria, fungi and protozoans, are responsible for much of the soil's fertility. Some of the bacteria and fungi are actually symbiotic with the root hairs of the trees, helping them absorb nutrients from the environment. It is the activity of these soil organisms which gives good forest soil its chocolate cakey texture, or tilth. Good tilth allows the soil to retain moisture and nutrients to circulate.

Sheet mulching provides this same secure habitat for soil organisms in areas where there might have been little or no humus to begin with.

To start a sheet mulch, cut down or trample all of the weeds and grasses in the area in which you want to garden. Leave them on the site because they

will be the source of much of the initial organic material. Next, sprinkle on some material high in nitrogen like manure or grass clippings, especially if the weeds and grasses on the site were scrawny or sparse. This layer of nitrogenous material will feed the first stages of the soil building process.

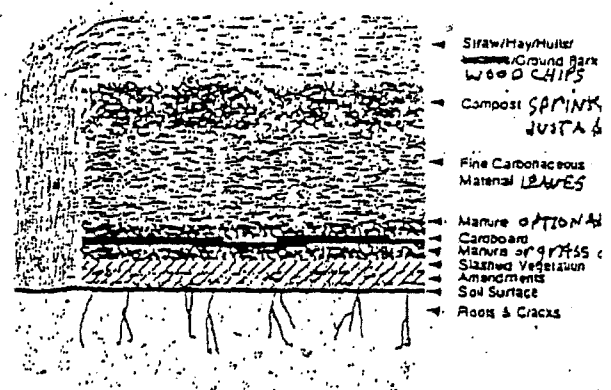
Now it's time to inoculate the soil with micro-organisms. Do this with a sprinkling of good compost. This imports worm eggs, bugs and myriads of invisible stuff like bacteria and fungi which will form the basis for the soil's new biodiversity and its healing.

Cover the entire area with a layer of corrugated cardboard. Flattened cardboard boxes work well, if the edges are overlapped to prevent weeds from poking through. A thick layer of newspaper can also be used in a pinch. This cardboard layer serves as a barrier, suppressing the growth of weeds by depriving them of light. The soil organisms, who find the cool, moist conditions under the cardboard to their liking, then start to devour the soft, light-starved weeds, which turn into rich humus. Worms, through their feeding and tunneling, allow moisture and delicate plant roots to penetrate deeper into the soil.

Weigh the cardboard down with a thick layer of wood chips. These are usually available free of charge from tree service contractors and municipalities. Try to get chips from deciduous trees. Conifer chips are very acid, take longer to break down and sometimes slow down the growth of other plants. Dead leaves can also be used to cover the cardboard layer. When mulching around existing trees or shrubs, make sure the mulch doesn't come directly in contact with the plant. This can cause the bark to rot.

The sheet mulch is now finished, except that it needs to be thoroughly soaked so that it can begin to work its magic. Results can be surprisingly fast.

Within weeks, white root-like structures of fungi, called hypha, become visible in the wood chip layer, a sign of healthy decomposition. Worms, millipedes and sow bugs soon proliferate. Under the mulch, the soil starts to darken or 'melanize' as its fertility increases.



Preliminary trials at Cottonwood Gardens have shown convincing results. Two Chinese pear trees were planted side by side, one in a sheet mulched area and the other just outside it. Within three months, most twigs on the mulched pear tree grew over a foot, while those on the unmulched tree grew less than three inches. Other young trees showed similar results.

To add new plants to the sheet mulch, simply poke holes through the wood chip and cardboard layer and fill with enough compost to accommodate the plant. This works wonderfully well for transplants and also for large seeds such as those of squash or beans. The wood chip layer should be topped up when it settles. Any emerging weeds or other organic material can be tucked under the mulch for rapid decomposition.

Sheet mulching is working with



# Cooking Seasonally



Did you miss out on last year's Granville Island Market After Dark?

Here's a sample of what you missed. Hubertus Surm, then Executive chef with Isadora's cooked up a storm with the following recipe:

## Variation on a West Coast Salad with Indian Candy and Sugar Kelp

### Vinaigrette:

- 1/4 cup seasoned rice vinegar
- 1 tsp chili paste
- 3 lbsp canola or light olive oil

### Salad:

- 4 strips Sugar Kelp (toasted)
- 6 oz indian candy salmon
- 4 oz sliced sockeye salmon
- 8 asparagus spears (blanched)
- 2 BC Hot House tomatoes
- 1 lb new pontiac potatoes
- 1/2 lb BC mixed salad greens

Wash the potatoes and steam with the skins on for 20 minutes or until a knife easily pierces the potato. cool and slice into 1/4" slices. Make the vinaigrette by pouring all the ingredients into a small bowl and whisking together. Sprinkle a little vinaigrette over the potatoes and reserve the remainder for the salad greens.

Arrange the potatoe slices around the rim of the plate. Cut asparagus

spear in half (lengthwise) and arrange on top of the potatoes. Toss the salad greens with the remaining vinaigrette and pile into the middle of the plate. Curl the sockeye salmon into a rose and place on top of the salad. Cut the tomato into quarters and arrange around salad.

Serve with a dark beer and crusty bread.

## Healing Urban Soils (cont'd)

nature, not against it. It results in a stable and nourishing soil ecosystem that increases in fertility over time. By using this simple technique anyone can make a contribution to offset the tragic loss of fertile soil that is occurring around our planet.

Oliver Kellhammer

Cottonwood Gardens is located on Malkin St. between Raymuir and Hawks St. in East Vancouver, adjacent to Strathcona Park. Gardeners generally do permaculture projects there on the last Sunday of every month, between the hours of 10:00 am and 3:00 pm. For more information call Oliver @ 253-2459

## Permaculture in Action: Techniques

### Recipe for No Till Potatoes in Straw

*Because no culture is permanent if it does not have a permanent agriculture, the first priority is in growing.*

Last year when I planted in February, I ate new potatoes in the 1st week of June, despite the cold spring.

This is a no till, low labour, low watering, food on demand method.

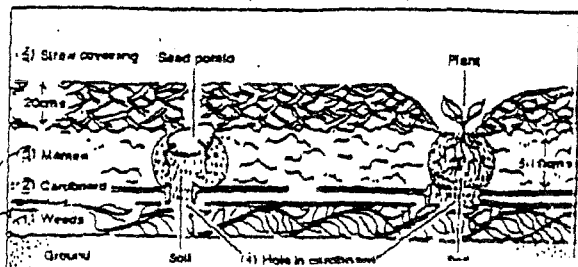
#### Usual Ingredients:

- 1) a sunny warm but well waterable spot in your garden which is weedy or grass covered
- 2) high nitrogen compost or some manure: not too much potatoes don't need high levels.
- 3) newspaper or cardboard depending on the weeds (if the ground is bare/weedless experiment with just leaves)
- 4) seed potatoes
- 5) some weedless soil (one shovel full per potato) or compost

- Place potato over the hole
- Place one Large shovel full of soil over the potato
- Optionally place leaves or other uncomposted over newspaper & soil
- Cover with a thick layer of straw
- Water it. Do not lime.

When the potatoes flower then there are new potatoes to pick. They will be all clean under the straw but on the newspaper. No dirty hands harvesting these, just carefully pull back the straw or just feel around with your hand in the straw and pluck the potatoes leaving the small ones. Every 2-3 weeks or so there will be a new crop ready and waiting. So pick just before supper. Harvest the remainder when the tops die back and let it dry out a bit so that they will store better. Be sure to cover the potatoes well with straw or other mulch after you harvest because they get green from sunlight.

Harold Waldock



- 6) straw or spoiled hay
- Trample but do not cut weeds
- Put high nitrogen layer down over it
- Throw the newspaper down opened and carefully arranged so that there are no gaps & water it into a mache (thickness depends on what weeds you have - usually the thicker the better)
- Take holes in cardboard