

ARNOLDIA



A continuation of the
BULLETIN OF POPULAR INFORMATION
of the Arnold Arboretum, Harvard University

VOLUME 24

APRIL 17, 1964

NUMBER 3

BLACK POLYETHYLENE AS A MULCH

THE Arnold Arboretum exhibited 24 different kinds of mulching materials in the New England Flower Show at Boston this spring, an educational exhibit which caused much favorable comment. Experiments and experience both have shown that in Massachusetts almost any material which can be used as a mulch results in better plant growth than where no mulching is used. There are many kinds of materials available, but one should consider several important points in making selections.

For instance, the appearance and suitability of the material is important. A mulch should be neat in appearance; it should not blow away in a high wind or wash away in a rain storm; it should not contain harmful materials to be leached out into the soil and cause damage to the plants.

A mulch should be easily applied and not too heavy to handle. Spent hops have been used in the Arboretum with good success, but the material as it comes from the brewery is 87 percent water and so is heavy to handle. Cocoa shells have been used also, but this is dry as a bone and very light when it is obtained. Crushed gray stone may be used as a mulch and it looks well, but it is heavy to handle and must be removed when the soil is to be worked, since it does not disintegrate. Maple leaves, when applied as a deep mulch, have a tendency to pack tightly and thus reduce the amount of air which is so necessary in the upper layers of soil where the feeding roots are located.

The cost and availability of a mulch are, of course, important. Ground redwood bark and ground sugar cane (bagasse) may be excellent mulching materials in areas where they are easily available locally, but shipping costs to the New England area make these rather costly when compared with others.

Finally, the length of time the mulch is serviceable is important. Some may last only a year or two, while others may remain in good condition for four years or longer, if undisturbed.

When planting trees and shrubs in sod, the area where the soil was disturbed

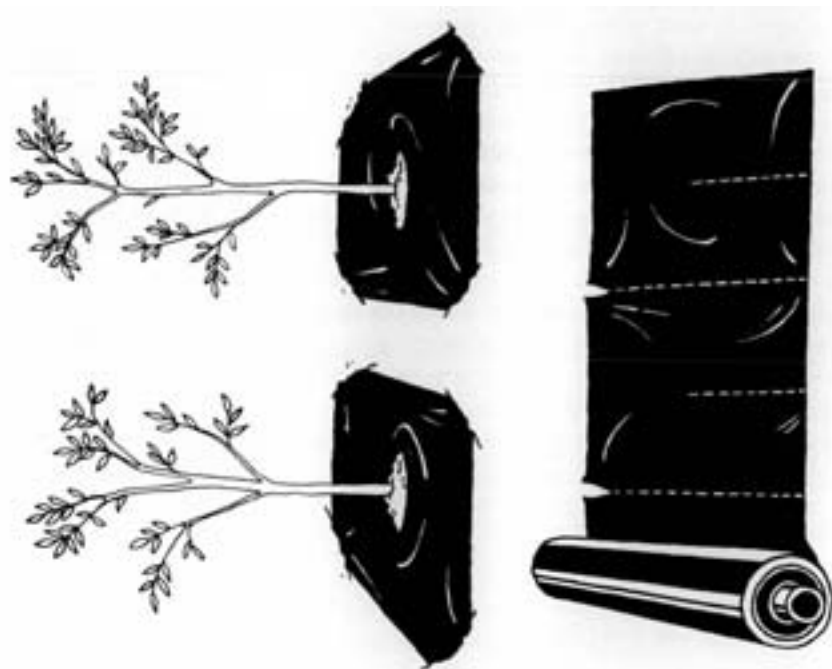


PLATE II

in the planting process is quickly overgrown with grass. This may look well as far as the lawn is concerned, but it can be bad for the young plant since the vigorous growing grass (and/or weeds) will compete with the plant in its struggle for nourishment and moisture from the upper few inches of the soil.

If a mulch is applied in a ring around the tree, grass and weeds are reduced or eliminated and more nourishment and moisture become available for the young plant. After a few years, if the tree is well established, it can compete favorably with the grass, but those first few years are very important in the success or failure of that young plant.

Polyethylene film is an ideal material for all kinds of horticultural uses. In fact, we could hardly do without it today. The use of black polyethylene as a mulching material has been widely and successfully tried with vegetables, pineapples and certain flower crops. It is now easy to use black polyethylene when planting trees and woody shrubs merely because an enterprising company in New Jersey has begun to manufacture and merchandise it in large or small quantities in a form easily used by anyone.

Five years ago we placed black polyethylene squares around some plants at the Case Estates in Weston, merely to see whether it would prove a satisfactory mulch. *Cornus mas*, *Viburnum dilatatum*, a few crab apples and some grape vines were selected as the subjects for trial. Some of the plants were only about four feet tall at the time and had been struggling along in the same situation for three years, having a most difficult time because the soil in these areas is gravelly and extremely dry. They wilted occasionally unless watered during the hot summer, an indication that they would not grow well, or possibly live long in those situations, unless something were done. Four-foot squares of black polyethylene were placed around them in 1958 and the plants have thrived ever since.

Black polyethylene as a mulching material aids in the conservation of soil moisture about the plant. Holes are punched at a few places to allow the water to drain through. Of course no weeds or grass grow underneath. Also, one of the important properties of any polyethylene film is that most gases can diffuse through it normally, but water vapor cannot. Hence this does not cut off normal soil aeration as do many thickly applied mulches, and definitely conserves soil moisture by preventing water evaporation from the soil covered by the polyethylene.

The Gerling Plastics Company (a department of Monsanto Chemical Company) of Kenilworth, New Jersey, started manufacturing these squares in 1961 (available from Eastern States Farmers Exchange outlets), although black polyethylene

Plate II. Left: Sketch showing the roll of perforated black polyethylene squares and method of "digging in" the corners when laid about the base of the plants. Right: The black polyethylene was laid about the base of this *Cornus mas* 5 years ago when this plant was 3 feet tall. The polyethylene is in good condition with a few leaves and twigs on top, and grass which has overgrown slightly from the edge, but it saved this plant from dying in very poor, dry soil. The plant is now 8 feet tall.

had previously been available in rolls. These squares are marketed in rolls with perforations at three- or four-foot intervals so that they may be easily torn from the roll, square by square. There is also a perforation line to the center of the square so that this can be opened and fitted around the tree trunk and they are being used in large numbers in planting young fruit orchards of various kinds about the country.

We have found it advisable to dig the four corners of the film square into the grass sod, merely by lifting a piece of sod, placing the corner underneath and letting the sod fall back into place. This is better than placing stones on the corners. Also, it is advisable to punch a few holes with a nail or an ice pick in the depressions, merely to insure that rain water will leak through to the soil underneath.

Black polyethylene (of 2 mil. thickness) thus placed has lasted for five years about the few shrubs and trees at the Case Estates and is still in serviceable condition. One must be careful that the film is not cut with the lawn mower, but other than that, this mulch needs no attention whatsoever.

One square may cost six to twenty cents (depending on the size and thickness of the film), which is little enough when one considers the fact that the plant has a far better chance of survival and may sometimes grow twice as much in one year because of the mulch.

Placing a layer of black polyethylene film on the soil as a mulch around a tree or shrub at planting time is the surest and most inexpensive way of obtaining good growth during the first five critical years that follow.

DONALD WYMAN