



TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE MICHIGAN

AGRONOMY: #26
SUBJECT: Muck Soils
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To: All Offices

From: James R. Stacey, *JS* State Resource Conservationist

Because organic soils are lightweight, dark colored and poor conductors of heat, they present a number of management problems. How do you farm to combat: (1) wind erosion, (2) frost damage, (3) surface crusting, (4) soil too tight, (5) soil too loose and (6) burning off small seedlings?

Wind Erosion - Wind erosion causes loss of crops, increases weed problems in bare spots, often results in burning off with late replanting, causes loss of valuable topsoil and fertilizer, fills ditches, covers fence lines and creates unpleasant relationships in the homes and offices that are in the path of the dust. To control wind erosion we need to:

- (1) Plant wind barriers.
- (2) Use conservation tillage.
- (3) Plant cover crops.
- (4) Install wind stripcropping.

Obviously, the items mentioned above may have limitations. A radish grower, to use present-day harvesting equipment, needs a table smooth field. Crops like onions, lettuce and carrots must have a seedbed free of clods. The seedbed actually may only need to be a couple of inches wide. The root bed is the rest of the area. A properly built drill will provide both a seedbed and leave a good root bed.

Three pieces of equipment that can create serious wind erosion conditions are rollers, the spike-tooth drag or harrows. These implements have their place, but should be used sparingly. A roller can be used if soils are too loose and dry to get moisture up close to the seed and is also recommended for peaty soils that are subject to frost.

2/19

Some growers attempt to control wind erosion by sprinkler irrigation. This is not practical if large acreages are exposed to wind erosion. When the soil surface dries to a depth of only several soil particles, the top dry ones can blow. Also, much of the wind erosion takes place in the spring before the irrigation equipment is set up to operate. When winds are strong and warm, it is almost impossible to keep the soil surface wet enough to prevent blowing.

Plowing and fitting land for fall seedings of rye in bands spaced about three to six feet apart is a good way to control soil blowing. This is especially recommended on black sandy areas and exposed ridges that are known problem areas.

Frost - After wind erosion, the next concern of the grower is usually frost damage. Ample surface moisture and a firm seedbed (note seedbed, not root bed) are needed to help control frost. This means keeping tillage equipment in the shed when frosty weather conditions exist and using herbicides to control weeds. Wetting the soil by irrigation prior to a potential frost can be helpful in minimizing frost injury.

Crusting - This condition can result if fields receive beating rains or excessive irrigation after seeding. Crusting is more noticeable when large quantities of fertilizer are placed below the seed. The movement of the salts up to the surface helps bind the soil particles together. Proper fertilizer placement and periodic light irrigation of less than 0.5 inches, until the plants have emerged, will minimize the crusting problem. Cultivation will also help break the crust. However, cultivation may be helpful to break the crust but may be detrimental by disturbing the germinating seedlings, especially carrots.

In wet springs, growers often seed when the field is too wet. As the field dries, the soil may crack along the row because of insufficient soil pulled into the row at planting time. The covering shoe on the seeder will help prevent this cracking condition.

Soil Too Tight - Crusting can be a problem before seed emerges, but the soil can be too tight after plants emerge. If you can dig down three or four inches with your hand, your soil is sufficiently loose. If not, you may have a soil compaction problem which will aggravate nitrogen efficiency problems and result in poor root shape formation for carrots. Excessive use of farm equipment is the main cause of soil compaction and is a greater problem on older, more decomposed muck fields. To correct the problem, chisel the field before an extensive root system has formed. Often a single, narrow hook set to chisel about four or five inches deep and placed between each crop row will be sufficient tillage to loosen the soil.

Soil Too Loose And Dry - Muck fields in the spring are generally wet and cold. Here is one condition where a roller would be helpful for small seedlings. The best approach is to plow, till, cultipack and plant in the same day. Nearly all muck farmers have and use rollover plows so they can plow back and forth and still turn the soil only one way.

A serious objection to the roller, fertilizer placement drill and seeder commonly used by Michigan growers is that the roller pushes dry soil into the fertilizer disc opener furrow. If this is happening, lift up the discs and broadcast the fertilizer. Offsetting the fertilizer disk opener slightly can also help.

Burning Off Of Small Seedlings - Afternoon soil temperatures during the May 15 to 19 period can reach 115°F, which is far too high for small plants. Burning off is usually not a problem with April seedings but is a problem with re-planting or June seedings. Surface irrigation and clipping the grain wind-break may be helpful to lower soil surface temperatures. Loose, dry soil that blows on the row will aggravate the problem.

Many of the principles of conservation tillage now used for upland soil can and should be used for muck soil. These methods are especially recommended for crops such as corn, beans, potatoes and mint, and with proper equipment can be used with small seeded crops. Weed control can be accomplished with the use of herbicides.

For clean-tillage operations, plow-planting will reduce the exposure period for wind erosion.

Water level control structures in subsurface drains and open ditches can be used to reduce soil subsidence, for frost protection and subirrigation.

The seedbed needs to be limited to a narrow band in the row. The root bed refers to the rest of the soil. Each has a different soil requirement.

Adapted from information prepared by Robert E. Lucas and Darryl D. Warncke, Michigan State University, Extension Specialist in Soils.

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2/4