TECHNICAL NOTES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

ROOM 101, 1405 SOUTH HARRISON ROAD
EAST LANSING, MICHIGAN 48823

ADMINISTRATIVE MATERIAL - FOR USE ONLY WITHIN THE SOIL CONSERVATION SERVICE

Agronomy ~~#~~ 7
SUBJECT: Asparagus Field Management
Erosion Control
DATE: April 24, 1974

To: All Offices

From: Richard H. Drullinger, State Resource Conservationist

A no-tillage system of culture is proving valuable in reducing erosion in established asparagus beds. Asparagus fields are particularly subject to soil erosion from both water and wind. Under normal operations, the soil surface is bare, or nearly bare, throughout the year. The ferns or vegetative tops which are allowed to grow after harvest do not provide much soil protection against water erosion. It is necessary of course for the ferns to complete their growth undisturbed in order to store food in the asparagus roots. It is on this stored food that the next year's crop is produced.

Asparagus growers' normal operations involve disking an established field in April, harvesting for approximately 8 weeks, then disking again at the end of harvest. Ferns may be allowed to stand until shortly before the April disking when they are chopped or mowed off.

Weed control is generally accomplished with 3-4# of simazine or diuron per acre per year. Excessively heavy grass growth or broadleaf weed infestation may also require occasional applications of dalapon or 2, 4-D. The use of herbicides for grass control makes it nearly impossible to use small grains or grasses for over-winter cover. Improved management of ferns, however, can substitute for over-winter cover and provide some protection through the next growing season.

Dr. A. R. Putnam of Michigan State University initiated research in 1967 on a no-till cultural system for asparagus and obtained promising yield increases on small plots.[1/] Research tests conducted in Oceana County by Dr. Putnam have shown average yield losses of 360 pounds of asparagus per acre due to conventional tillage practices.

The facts which follow are based partly on Dr. Putnam's work and on the experience of SCS District Conservationist Jack D. Lake who reports on 28 Oceana County growers who are practicing no-tillage on asparagus, and of Dr. James Motes, MSU Extension Specialist in Horticulture, who works closely with asparagus growers throughout the state.

No-till management involves no soil disturbance with disk or any other tillage implement in established beds. Weed control is accomplished by herbicide application.

Growers who have followed this system for the past 3 or 4 years now have been getting a 200 to 300 pound per acre increase in yield of marketable spears - largely due to the fact that there is no disking to damage underground plant parts.

No-till on the coarse-textured soils on which asparagus is normally produced results in much less soil loss according to these growers. Also, soil moisture is conserved on those soils by the asparagus fern mulch on the soil surface.

Soil loss can be reduced even further by proper management of the ferns. Dr. R. L. Carolus, of MSU's Department of Horticulture, reported fern production of 522 to 6612 lbs. of dry matter per acre. 2/ Well-distributed crop residues on the soil surface can slow water runoff and prevent erosion by both water and wind.

The ferns can be chopped fairly high right after killing frost in fall, leaving 8 to 10 inches of stubble to prevent ferns from blowing off the field. Chopping with a rotary mower will leave ferns in good contact with the soil surface.

Dr. Motes suggests that having the ferns in the surface may have still another advantage in spring. The insulation they provide then might keep soil temperatures cooler, delaying the initiation of plant growth for a few days. This could result in further increased yields by preventing the freezing off of the first cutting or two which occurs fairly frequently. In addition, the number of volunteer asparagus seedlings has been reduced in many fields where no-till is utilized.

The high mowing in fall would necessitate another, low, clipping in April. This, however, should be a minor chore considering the benefits: the elimination of two diskings, an increase of two to three hundred pounds of quality crop and a dramatic reduction in soil loss.

No-tillage for asparagus can be most effective if the following steps are utilized:

1. Start with a field free of perennial grass. Corn production with atrazine herbicide in the field for 2 years before establishing an asparagus bed is ideal.

2. If possible, during establishment years before fern production will provide soil protection, haul in 1 or 2 tons per acre of straw, strawy manure or other organic residue for surface mulch.

3. Follow herbicide recommendations for weed control.

65

4. Avoid, as much as possible, compacting the soil. Flotation tires on equipment and elimination of disking can help this point.

5. Manage ferns as indicated above for soil protection.

1/ A. R. Putnam; Efficacy of a Zero-tillage Cultural System for Asparagus Produced from Seed and Crowns. Jour. of the Amer. Soc. for Hort. Sci., vol 97(5): 621-624, 1972.

2/ L. D. Brown and R. L. Carolus; An Evaluation of Fertilizer Practice in Relation to Nutrient Requirement of Asparagus. Proceedings of Amer. Soc. for Hort. Sci., vol 86, 1965.