



TECHNICAL NOTES

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE MICHIGAN

Agronomy 14

SUBJECT: Tall Wheatgrass
Vegetative Barriers

DATE: Revised February 1984

To: All Offices

From: Robert R. Ditson, State Resource Conservationist

Introduction

The practice of using barriers at intervals across cropland to provide protection against wind erosion is not new. Woody plantings have been used for many years, as have rows of tall growing annual crops such as corn or sorghums. Perennial grass barriers have been used in the south to protect melon and peanut plantings and in the northern plains to protect wheat and row crops.

The primary purpose of barriers is to reduce wind erosion and crop damage.

The Barrier System

The perennial grass barrier system currently used in other states is made up of two rows of tall wheatgrass planted 12 to 42 inches apart with a 30 to 60 foot interval of cropland between the barriers. Actual spacings in Michigan will be determined by the use of the wind erosion equation. The grass rows should be oriented, as nearly as possible, at right angles to the prevailing winter and spring winds. Two rows assures protection in the event part of a row is rendered ineffective due to tillage operations or poor stands.

Species Selection

Plant growth characteristics of tall wheatgrass make it ideally suited to the design criteria needed for the following reasons:

1. Tall wheatgrass establishes easily and produces a good barrier in a minimum period of time.

2. It has a stiff stem which remains erect and effective all winter.
3. It is adapted to a wide range of conditions, including coarse textured soils, saline conditions and drought.
4. Seed is available.
5. It consistently produces seed stalks which are essential to maintaining barrier height. Height is about 4 feet.
6. It is a bunchgrass and therefore easily confined to a narrow row.
7. Provides nearly uniform distribution of snow between barriers.

Advantages of Grass Barriers:

1. The barriers will furnish protection during crop stand establishment.
2. In areas where it is usually necessary to wait until after the spring blow period to plant, the crop can be put in earlier.
3. Grass barriers, because of the narrower spacing, are more effective for wind erosion control and uniform snow distribution than taller more widely spaced barriers when winds blow at other than a right angle to the barriers.
4. Snow distribution and soil water recharge is more uniform between grass barrier systems than tree barrier systems when both are designed on spaces of 10 times the height of the barriers.
5. Aerial spraying for weed control is feasible; whereas, aerial spraying is not feasible with tree shelterbelts.
6. Barriers can be easily eliminated and re-established if equipment changes become necessary and new intervals are required.
7. Grass barriers enhance wildlife habitat and improve the aesthetics of the area.
8. Establishment costs are low with little "out-of-pocket" investment required.
9. Time of establishment is relatively short compared to tree windbreaks.
10. Land out of production because of barriers may be counted by the County ASC Committee as conservation base acres under the ASCS farm program. In some counties the County ASC Committee may accept this land as "set aside" acres.

Disadvantages of Grass Barriers

1. Not all of the land is cropable. (About 10 percent of the land will be occupied by the grass rows using 50 foot intervals between barriers and a row spacing of 30 inches plus an 18 inch allowance for barrier growth on each side of the grass rows.)
2. Weed control will be more difficult.
3. Disease, insect, and rodent problems may increase with cropping intensity or other factors associated with grass barriers.
4. The narrower cropping strips with grass on both sides may require more time to farm.
5. The vegetative barriers should be spaced to fit both planting and harvesting equipment.
6. Width of harvesting equipment may not be compatible with barrier intervals which adds considerable time to the harvest period. Equipment which will permit a round trip with a fairly generous overlap is most satisfactory for working between barriers.

Selecting the Spacing of Barriers

Select an interval between barriers that will fit the planting and harvesting equipment, plus meet the needs for soil protection. The total distance between the centerlines of the barriers will be the cropland width selected plus the distance between the two rows of each barrier plus about 36 inches (3 feet) to allow for a bare area of about 18 inches on each side of the barrier. The two rows should be from 12 to 42 inches apart.

Example:

If a 50 foot interval is selected and the grass rows are spaced 30 inches apart and have 18 inches of bare area on each side, the distance between the centerlines of the barriers will be 50 feet + 2 1/2 feet + 3 feet or 55 1/2 feet.

Where wide equipment, such as 48 foot, is used and only one pass will be made between barriers, it is recommended that the distance on each side be increased from 18 inches to two feet.

Seed Requirements For Two Row Tall Wheatgrass Barriers

Seed 15 seeds per foot of row. If a grain drill is used, set the drill to seed smooth bromegrass at the rate of 15 pounds per acre and seed through 2 planting units. For 2 rows 1000 feet long, it requires .4 of a pound of tall wheatgrass seed.

Interval Between Centerline of Barriers (Two rows-30" apart)	1/ Pounds of Pure Live Seed Needed Per Acre Protected	Pounds of Seed of Average 85% PLS Quality
30 feet	0.55	0.65
40 "	0.41	0.48
50 "	0.33	0.39
60 "	0.28	0.33

1/ Based on tall wheatgrass averaging 79,000 seeds per pound of pure seed, and seeding 15 live seed per foot of row.

Establishment

Establishment of tall wheatgrass on soils which are not highly erosive is similar to planting pasture and hayland. It is important to have a close, uniform stand with no gaps.

On coarse, sandy soils it is essential to plan protection for the developing stand of tall wheatgrass until the barriers have reached a stage where they can prevent wind erosion on the field. A few examples follow:

1. Establish temporary barriers with annual crops that grow at least four feet tall and remain upright, such as forage sorghums or sudangrass. These can be planted after the spring blow season and left standing through the next blow season. Another method would be to seed cereal rye on the windward side of the vegetative barrier. If a grain drill is used, the rye can be seeded with the unused portion of the drill.
2. If the field has been idle and has a protective cover of weeds, has grain stubble, or is a forage crop:
 - (a) Fallow a narrow strip where each barrier is to be established.
 - (b) Seed about the middle of August if moisture is available, or early the following spring.

- (c) Do not begin tillage of the intervals between barriers until barriers are fully established.
3. Fallow narrow strips on the leeward side of this year's crop or in the crop at the proper intervals. Seed in spring if clean or the middle of August if moisture is available. Leave crop stubble, or adequate residue, until the spring blow season is past.

It is important that the seedbed be free of weeds and volunteer grain and that it is firm. It is suggested that the seedbed be cultipacked before and after seeding. If the drill is equipped with packer wheels, both ahead and behind planting shoe, cultipacking would not be necessary. Plant in a wheel track if possible.

Use a planter that will provide uniform flow of seed, positive depth control (depth bands are best) and packing soil over the seed. Seed at the rate of 15 pure live seeds per foot of row without a companion crop. Seeds should be 3/4 to 1-inch deep on sandy soils and about 1/2-inch deep on other soils.

Do not apply more than 40 pounds of N per acre in the starter fertilizer at seeding time.

Management

1. Control weeds during the year of establishment and as needed thereafter by cultivating or with chemicals. Tall wheatgrass is a competitive plant and once a good stand is established cultivation may not be necessary in some localities. Generally cultivation will be necessary during the establishment year.
2. Make an initial application of about 40 pounds N per acre and thereafter as needed to maintain adequate barrier height for soil protection.
3. Do not harvest seed. This will reduce barrier height.
4. Do not permit grazing of the field.
5. Crop the intervals between barriers in any adapted crop sequence.

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