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SEEDING PRACTICES for MICHIGAN CROPS

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HIGH QUALITY SEED is important in obtaining a good plant population, high yield per acre and high quality in the harvested crop. High quality seed means: high germination (usually above 90 percent); freedom from noxious weeds; and relative freedom from other crop seed, disease, weed seeds, and inert matter. Seed of unknown origin or of unknown variety should never be planted. In addition, seed should be of uniform size for accurate planting. Certified seed represents the most reliable source of high quality seed.

Planting information here is based on the use of high quality seed. Seeding rates should be increased if substandard seed is planted in emergency situations.

Rate, Time, Depth

Information concerning rate, time and depth of seeding, as well as the weight per bushel and seeds per pound of various crops which may be produced in Michigan are given in Table 6, pages 3, 4, 5.

Seed Spacing for Row Crops

Proper seed spacing in the row is necessary to obtain a desired plant stand and high yield per acre. Seed spacing is influenced by row width, the crop to be planted, the soil and sometimes the use of the crop.

A close spacing in the row (heavy planting rate) can result in excessive plant competition for water and nutrients, barrenness in corn and lodging in soybeans. Wide spacing may result in incomplete utilization of water and nutrients and there may be more suckers on corn plants and often lower yields of corn, soybeans and field beans. The following information can be used as a guide in deciding the most desirable plant population and in calculating seed requirements at different planting rates.

Getting the Desired Stand

Seed corn, spaced 12 inches apart in 28 inch rows gives a seed population (potential plant population) of 18,700 seeds per acre (Table 1). Using seed of high quality under average conditions for moisture and temperature, 10 to 15 percent seed and seedling mortality may be expected. On organic soils, or with very early planting on mineral soils, these losses may reach 20 percent. Therefore, for a stand of 18,700 plants per acre, place seed about 11 inches apart in a 28 inch row, making a seed population of 20,400. These principles also apply to other row crops.

Designating a Planting Rate for Row Crops

It has been customary to express planting rates for field seeds in pounds or bushels per acre. However, with the large number of varieties (and hybrids) available and the great variation in seed size (grades), other methods of designating planting rates seem more appropriate. Seeds per foot of row might be a better designation for soybeans, field beans and grain sorghum. It is now common to use "inches between seeds" for hybrid corn.

By using these designations, the same planting rate may be used for each variety, regardless of seed size or how the lot is screened or graded. To calculate total seed requirements for a field or farm, you need to know the number of seeds per pound for the seed lot(s) to be planted.

Planting Speed Affects Plant Stand

Seed spacing in the row is affected by planting speed. For many corn planters, a speed of 3 to 4 miles per hour is optimum. At higher speeds, uniform spacing of seeds is reduced and there is a tendency toward skipping and bunching. Newer planters are more accurate at higher speeds. The use of planter plates with more cells per plate will improve planting accuracy at higher speeds. Plateless planters may allow higher speed without sacrificing planting accuracy. Under any conditions, a check should be made to determine the quality of the planting operation, in terms of spacing accuracy and number of seeds delivered per acre or foot of row, etc.

TABLE 1. Approximate number of seeds per acre at varying row widths and spacings in the row (7-inch row is solid seeding).

Seed spacing in the row (inches)	Row width (inches)									
	7	14	20	24	28	30	32	36	38	40
1	896,000	448,000	314,000	261,000	224,000	209,000	196,000	174,000	165,000	157,000
1.5	598,000	299,000	209,000	174,000	149,000	139,000	131,000	116,100	110,000	104,000
2	448,000	224,000	155,000	131,000	112,000	104,000	98,000	87,100	82,500	78,400
3	298,000	149,300	104,000	87,100	74,800	69,700	65,400	58,000	55,000	52,300
4	224,000	112,000	78,400	65,300	56,000	52,200	49,000	43,500	41,300	39,200
5	179,000	89,600	62,700	52,300	44,900	41,800	39,200	34,800	33,000	31,400
6	149,000	74,700	52,400	43,600	37,300	34,800	32,700	29,000	27,500	26,100
7	217,000	63,500	44,400	37,000	31,700	29,600	27,800	24,700	23,400	22,200
8	112,000	56,000	39,100	32,700	28,000	26,100	24,500	21,800	20,600	19,600
9	99,300	49,700	34,800	29,000	24,800	23,100	21,700	19,300	18,300	17,400
10	89,600	44,800	31,400	26,100	22,400	20,900	19,600	17,400	16,500	15,700
11	81,400	40,700	28,500	23,700	20,400	19,000	17,800	15,800	15,000	14,300
12	74,700	37,300	26,100	21,800	18,700	17,400	16,300	14,500	13,800	13,100

TABLE 2. Suggested planting rates for soybeans in rows.

Row width (inches)	Seeds/ft. of row	Approx. lbs/A
36	10-11	50 - 70
28-30	7-8	45 - 65
18-20	5-6	50 - 70
14	4-5	60 - 80

(Growers who have special soil crusting problems which cannot be handled with a rotary hoe or similar equipment may want to add an additional seed per foot of row. Pounds per acre will vary with the variety because of differences in seed size.)

TABLE 3. Suggested planting rates for field beans.

Type	Row width (inches)	Seeds/ft. of row	Approx. lbs/A
Navy	28	4 to 5	40
Cranberry	28 - 32	3 to 4	60
Kidney	28 - 32	3 to 4	60
Yelloweye	28 - 32	4	60
Pinto	28	4	50

TABLE 4. Suggested corn plant populations.

Yield Goal (bu./A)	Plants/Acre
70 - 80	14,000 - 16,000
90 - 120	18,000 - 19,000
130 - 200	20,000 - 23,000

(If corn is planted by May 1, use a seed population 15 to 20 percent higher than the desired plant population. If planting is delayed until after May 20 use 10 percent more seed than desired plants.)

TABLE 5. Approximate numbers of seed per unit in good quality bean seed.

Type	seeds/pound	seeds/cwt or bu
Navy bean	2,200	220,000/cwt
Cranberry bean	900	90,000/cwt
Red kidney bean	800	80,000/cwt
Pinto bean	1,200	120,000/cwt
Yelloweye bean	950	95,000/cwt
Soybean, small size seed	3,000	180,000/bu
Soybean, medium size seed	2,600	156,000/bu
Soybean, large size seed	2,200	132,000/bu

The above estimates should serve only as a guide. To be accurate, calculate the number of seeds in the lot to be planted. Weigh out an ounce of seed, count the number of seeds, and multiply by 16 to obtain seeds per pound. Another method is to weigh out ¼ pound of seed, count the seeds and multiply by 4 to get seeds per pound. Bushels can be obtained by dividing by the number of pounds in a bushel for any particular crop.

Calculating Seed Requirements

Suppose you wish to plant 50 acres of a large-seeded soybean variety in 30-inch rows at the rate of 10 seeds per foot of row. How much seed is needed? In Table 1 the rate "10 seeds per foot of row" falls midway between a seed spacing in the row of 1 and 1.5 inches (12 in. ÷ 10 in. = 1.2 in.). Therefore, the number of seeds required per acre would fall midway between 209,000 and 139,000 or about *174,000* seeds. Accord-

ing to Table 5, the number of seeds per pound of a large seeded variety is 2,200. To figure seed needs for 50 acres:

Multiply 174,000 seeds/acre × 50 acres and divide by 2,200 seeds/pound = 3,955 pounds or 66 bushels.

For hybrid corn you may desire a population of 20,000 plants per acre in 30-inch rows. Under average growing conditions, allow about 15 percent extra seed to account for seed and seedling mortality so the seed requirement is 23,000 seeds per acre. In Table 1, under the 30 inch row spacing, the closest number of kernels to 23,000 shows that seed spaced 9 inches apart in 30-inch rows will require 23,100 kernels if distribution by the planter is perfect. If your seed has 1,600 kernels per pound, 1 bushel (56 pounds) will plant 3.9 acres (89,600 divided by 23,000 = 3.9).

TABLE 6. Weight per bushel, seeds per pound and seeding rate, depth, and date for Michigan crops.

CROP	WEIGHT PER BUSHEL (LBS.)	NO. SEEDS PER LB.	SEEDING RATE PER ACRE (LBS.)	PLANTING DEPTH (INCHES)	PLANTING DATE	REMARKS
FORAGE LEGUMES						
Alfalfa	60	220,000	6-12 alone or in grass mixture	½	With small grains in spring or June 15-August 20, alone	Band seeding method preferred.
Alsike clover	60	680,000	3-5 in grass mixture	½	With small grains in spring	Band seed. Use in lowland pasture mixtures.
Ladino clover	60	860,000	1-2 alone (See remarks)	½	With small grains in spring	Band seed. Use ½ lb. of seed in alfalfa-brome mixtures.
Red and Mammoth clover	60	260,000	6-10 alone or in grass mixture	½	With small grains in spring	Band seed.
Sweet Clover	60	250,000	12-15 alone	½	With small grains in spring	Band seed.
Birdsfoot trefoil	60	370,000	4-5 alone or in grass mixture	½	With small grains in spring	Use band seeding method. Use double amount of inoculant.
GRASSES FOR FORAGE, PASTURE, GREENCHOP, TURF, AND COVER CROP						
Kentucky bluegrass	14-28	2,200,000	15-30	½	Aug. 15 - Sept. 15, Nov. 15 - May 1	August planting preferred. For turf use ½ lbs. per 1,000 square feet.
Bromegrass, field	—	—	10-15	½	Last cultivation of corn	For winter cover.
Bromegrass, smooth	14	135,000	3-5 in legume mixture 12-alone	½	Fall or spring with small grains —fall preferred	Normally seeded with alfalfa.
Corn (field)	56	variable	1-2 bu. (100,000 plants)	2	May 1-June 1	Use only for green chop.
Fescue, Red	15-40	545,000	15-30	½	Aug. - April	Same as for Kentucky bluegrass.
Fescue, Tall	—	225,000	30-50	½	Aug. 15 - Sept. 15, Nov. 15 - May 1	Use only for coarse turf-playgrounds, etc. 4-6 lbs. per 1000 sq. ft.
Orchard grass	14	590,000	20-25 alone 5-12 in mixture	½	Fall or spring— fall preferred	Use late maturing varieties

Table 6 (Continued)—Grasses for Forage, Pasture, Greenchop, Turf, and Cover Crop

CROP	WEIGHT PER BUSHEL (LBS.)	NO. SEEDS PER LB.	SEEDING RATE PER ACRE (LBS.)	PLANTING DEPTH (INCHES)	PLANTING DATE	REMARKS
Millet (forage)	50	220,000	30-40	½-1	June 1-30	Emergency crop.
Rape	50	157,000	4-6	1-2	April-June	
Sorghum (forage)	50	15,000-20,000	5-8	1-2	About 2 weeks after normal corn planting time May 20-June 10	Plant in rows. Use for silage.
Sorghum-sudan-grass hybrid	—	15,000-20,000	40	1	May 15-June 15	Green chop. Plant solid.
Sudan grass	40	55,000	20-25	1	May 15-June 15	Summer pasture.
Reed Canary grass	44-48	550,000	4-6	½	Aug. 1-20	On wet soils-especially wet muck soils.
Redtop	14	5,000,000	2-3 in mixtures	½	Fall or spring—fall preferred	Normally not used—adapted moist soils in mixtures.
Ryegrass, domestic	24	250,000	10	½	Last cultivation of corn	Frequently seeded alone or with sweet clover for winter cover.
Timothy	45	1,230,000	2-in fall 4-in spring legume mixture	½	Fall or spring with small grains —fall preferred	Band seed. Normally seeded with alfalfa and red clover.
CASH AND FEED CROPS						
Barley (spring)	48	13,000	96	1-2	Soon as possible in spring— Apr. 1-May 1	
Barley (winter)	48	13,000	72-96	1-2	Sept. 1-20	
Field beans (navy)	60	2,200-2,400	30-45	2	May 25-June 25 Preferably June 1-5	
Field beans (kidney)	60	800-900	60-80	2	June 1-15	
Field beans (cranberry and yelloweye)	60	850-1,000	60	2	June 1-15	
Corn (field)	56	1,300-2,200	10-16	2-3	May 1-June 1	Seeding rate per acre depends upon seed grade, soil productivity and time of planting.
Corn (pop)	56	3,000-4,000	3-5	1-2	May 5-June 1	Seeds per pound depends on type.
Buckwheat	48	20,000	45-60	1-2	June - early July	For grain and summer green manure.
Flax	56	135,000	28-40	1-2	Soon as possible in spring	
Millet, pearl	56	85,000	10-15	½-1		
Millet, (grain)	50	80,000	10-15	½-1	June 1-30	Emergency crop.
Oats	32	13,000	64-80	1-2	Soon as possible in spring— Apr. 1-May 1	
Potatoes	60		30-35 bu. 18-20 bu. per acre of Russet Burbank	4-5	May 1-June 1	
Sorghum (grain)	56	15,000-20,000	4-6	1-2	Same as for forage sorghum	Plant in rows.

(Continued next page)

Table 6 (Continued)—Cash and Feed Crops

CROP	WEIGHT PER BUSHEL (LBS.)	NO. SEEDS PER LB.	SEEDING RATE PER ACRE (LBS.)	PLANTING DEPTH (INCHES)	PLANTING DATE	REMARKS
Soybeans	60	2,000-3,000	45-85 in rows	2	May 10-June 10	Plant in rows. If planted solid use 90-120 lbs. seed per acre.
Spelt	30-40		50-100	1-2	Sept. 10 - Oct. 10	
Sugar beets		56,000 (monogerm)	½—1-¼	½	Apr. 15-May 15	Seeds per pound depends upon screen size.
Sunflower	24	3,000-9,000	3-7	1-2	May 5-June 1	
Vetch	60	21,000	15-20	1-2	Sept. 10-Oct. 1	Seed in combination with rye.
Wheat (spring)	60	12,000	90	1-2	Soon as possible in spring	Not suitable for milling purposes.
Wheat (winter)	60	12,000	90-120	1-2	Sept. 10 - Oct. 10	Plant after fly-free date for the area.
Rye	56	18,000	56-84	1-2	Sept. 10 - Oct. 1	May be planted earlier for green manure or for winter cover in corn (in August).
MIXTURES						
Oats and peas			2-3 bu.	1-2	Apr.	Mix oats and peas in equal amounts.
Ryegrass and sweet clover			10-ryegrass 10-sw. clover	½	Last cultivation of corn	Cover crop.
OTHER CROPS						
Triticales	45-50		50	1-2	Soon as possible in spring Apr. 1-May 1	Not recommended for Michigan in 1974.
Crown vetch	60	140,000	20	½	Apr. 1-May 15 July 15-Aug. 15	Penngift and Emerald are good varieties. Scarify seed.

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