Seeding Practices for Michigan Crops
Michigan State University
Cooperative Extension Service
Farm Science Series
F.S. 611

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August 1965
6 pages

EXTENSION BULLETIN 489 F.S. 611
FARM SCIENCE SERIES MARCH, 1965
Cooperative Extension Service — Michigan State University

SEEDING PRACTICES for MICHIGAN CROPS

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HIGH QUALITY SEED is important in obtaining a good plant stand, high yields and quality in the harvested crop. High quality seed means: high germination (usually above 90 percent); freedom from disease and noxious weeds; and relative freedom from other crop seed, common weed seeds and inert matter. Whenever possible the seed should be of a known variety. In addition, the seed should be uniformly sized for accurate planting.

Considering all quality factors, certified seed is the seed which most nearly meets all of the requirements. The information furnished herein is based on the use of high quality seed. For seed of lower quality, seeding rates will have to be increased.

RATE, TIME AND DEPTH

Information concerning rate, time and depth of seeding, as well as weight per bushel and seeds per pound, are given in Table 4, page 3.

SEED SPACING FOR ROW CROPS

Proper seed spacing in the row is necessary to obtain a desired stand and high yields per acre. A desirable seed spacing in the row depends on the distance between rows, the crop, the use of the crop and the soil.

Narrow spacing in the row (heavy planting rates) can result in excessive plant competition for water and plant food. With soybeans and some other crops, too many plants can result in excessive lodging. Wide spacing in the row (light planting rates) may result in low yields

SUGGESTED PLANT POPULATIONS AND PLANTING RATES

Corn —

on first class soil	— 16,000 to 18,000 plants per acre
on second class soil	— 12,000 to 14,000 plants per acre
on productive muck soil	— 18,000 plants per acre

Soybeans —
50 to 60 pounds per acre, depending on seed size of the variety and the row width used.

Field beans —

navy or white pea	— 40 pounds per acre
kidney	— 80 pounds per acre
cranberry and yelloweye	— 60 pounds per acre

Table 1—Approximate number of seeds per acre at varying row widths and spacing in the row

Row width (inches)	Seed spacing in the row—(inches)								
	1	2	4	6	8	10	12	14	16
7	896,100	498,000	224,000	149,300	112,000	89,600	74,600	64,000	56,000
14	448,000	224,000	112,000	74,700	56,000	44,800	37,300	32,000	28,000
21	298,700	149,300	74,700	49,800	37,300	29,900	24,800	21,300	18,700
24	260,800	130,400	65,200	43,600	32,700	26,100	21,800	18,700	16,300
28	224,500	112,300	56,100	37,300	28,000	22,400	18,700	16,000	14,000
32	196,200	98,100	49,000	32,700	24,500	19,600	16,300	14,000	12,300
36	174,200	87,100	43,600	29,000	21,800	17,400	14,500	12,400	10,900
38	165,000	82,500	41,300	27,500	20,600	16,500	13,800	11,800	10,300
40	156,600	78,300	39,200	26,100	19,600	15,700	13,100	11,200	9,800
42	149,200	74,700	37,300	24,900	18,700	14,900	12,400	10,700	9,300

because of incomplete utilization of available water and plant food.

The information herein may be used as a guide in finding the most desirable plant population and calculating seed requirements at different planting rates.

SOME PLANTS DIE

Seed corn, spaced at 10 inches in a 40-inch row, gives 15,700 seeds per acre and in theory a population of 15,700 plants per acre. However, no seed lot has perfect germination. The germination percentage shown on the analysis tag was obtained under ideal conditions for germination. Under average field conditions of moisture and temperature, a 10 to 15 percent seed and seedling mortality may be expected. On muck soils losses may be slightly higher. With early planting, mortality may be as high as 15 to 20 percent. Some loss by cultivation usually occurs.

In view of the above facts, to obtain 15,700 plants per acre in 40-inch rows, the seed spacing in the row should be about 9 inches under average conditions. These same principles may be applied to other row crops.

Table 2—Approximate numbers of bean seeds per unit in good quality seed

Type or variety	Per pound	Per bushel or cwt
White pea bean (Sanilac)	2200	220,000 cwt
Cranberry bean	900	90,000 cwt
Red kidney bean	900	90,000 cwt
Yelloweye bean	1100	110,000 cwt
Large seeded soybean (Harosoy)	2600	156,000 bu
Small seeded soybean (Chippewa)	3000	180,000 bu

PLANTING SPEED AFFECTS STAND

Seed spacing in the row is affected by speed of planting. For most corn planters, when aiming at a population of 16,000 plants per acre, a speed of 3 to 3-1/2 miles per hour is optimum. Studies have shown that when the aim is 16,000 plants, each one mile per hour speed over 3 miles per hour will result in a reduction of 800 to 1000 plants per acre. At high planting speeds, uniform spacing of kernels is reduced, with a tendency toward skipping and bunching of kernels. The newest planters are frequently equipped to plant accurately at higher

Table 3—Approximate numbers of corn seeds per unit

Corn grade	Per pound	Per bushel
Large or regular flats	1300	73,000
Medium flats	1600	89,000
Medium rounds	1600	89,000

planter speeds. Check the seed spacing to be sure.

CALCULATING SEED REQUIREMENTS

Using tables 1, 2 and 3, it is possible to calculate the seed requirements per acre or total seed requirements per farm for corn, field beans, soybeans or other row crops. If a certain seeding rate per acre is used, the average distance between seeds in the row may be calculated. The final plant stand will also depend on seed germination and seedling mortality.

Seed size varies with the crop and variety, and in the case of hybrid seed corn with the grade (sizing). Tables 2 and 3 give the approximate number of seeds per pound and bushel or hundred weight (cwt) of field beans, soybeans and corn.

If white pea beans are planted at a rate of 40 pounds per acre in 28-inch rows, a total of about 88,000 seeds would be planted. They would average about 2-3/4 inches apart in the row.

Seeds per lb. x lb. per acre = seeds per acre
2200 x 40 = 88,000 **seeds per acre**

In table 1, at the 28-inch row spacing, the figure 88,000 falls between that for a 2-inch and 4-inch spacing in the row. But, it is closer to the 2-inch spacing. Precise calculation gives the 2-3/4-inch spacing.

Similar calculations may be made with grades of hybrid seed corn. If 15,000 kernels per acre in 40-inch rows are desired, table 4 shows that the seed should be spaced about 10 inches apart in the row. Seed requirements per acre for the various grades of Michigan certified hybrid seed corn* would be as follows:

$$\frac{\text{Kernels per acre}}{\text{Seeds per pound}} = \text{Pounds of seed per acre}$$

For large or regular flats $\frac{15,700}{1,300} = 12$ pounds per acre

For medium flats $\frac{15,700}{1,600} = 9.8$ pounds per acre

For medium rounds $\frac{15,700}{1,600} = 9.8$ pounds per acre

* *In determining the number of seeds per pound for the various grades of fungicide-treated hybrid corn, only the Michigan certified corn hybrids were used. As the number of seeds per unit within a grade may vary somewhat from company to company, no attempt is made to determine the numbers for other hybrids.*

Table 4—Weight per bushel, seeds per pound and seeding rate, depth, and date for Michigan crops.

Crop	Weight per bushel (pounds)	No. seeds per pound	Seeding rate per acre (pounds)	Planting depth (inches)	Planting date	Remarks
FORAGE LEGUMES						
Alfalfa	60	220,000	6-10 alone or in grass mixture	1/2	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	1/2	With small grains in spring	Band seed. Use in lowland pasture mixtures.
Ladino clover	60	860,000	1-2 alone (See remarks)	1/2	With small grains in spring	Band seed. Use 1/2 pound of seed in alfalfa-brome mixtures.
Red and Mammoth clover	60	260,000	6-10 alone or in grass mixture	1/2	With small grains in spring	Band seed.

Most of the legumes such as alfalfa, trefoil and clover are seeded in combination with perennial grasses such as timothy and bromegrass.

Table 4 — Continued

Crop	Weight per bushel (pounds)	No. seeds per pound	Seeding rate per acre (pounds)	Planting depth (inches)	Planting date	Remarks
Sweet Clover	60	250,000	12-15 alone	1/2	With small grains in spring	Band seed.
Birdsfoot trefoil	60	375,000	4-5 alone or in grass mixture	1/2	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	1/2	August 15 to September 15, November 15 to May 1	August planting preferred. For turf use 1-2 lbs. per 1,000 square feet.
Bromegrass, field	—	—	10-15	1/2	Last cultivation of corn	For winter cover.
Bromegrass, smooth	14	135,000	3-5 in legume mixture 12-alone	1/2	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	1/2	August-April	Same as for Kentucky bluegrass.
Fescue, Tall	—	225,000	30-50	1/2	August 15 to September 15, November 15 to 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	1/2	Fall or spring— fall preferred	Normally not recommended.
Millet (forage)	50	220,000	30-40	1/2-1	June 1-30	Emergency crop.
Rape	50	157,000	4-6	1-2	April-June	
Sorghum (forage)	50	28,000	5-8	1-2	About 2 weeks after normal corn planting time May 25-June 10	Plant in rows. Use for silage.
Sorghum-sudan-grass hybrid	—	15,000-20,000	40	1	May 15 to 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	1/2	August 1-20	On wet soils-especially wet muck soils.
Redtop	14	5,000,000	2-3 in mixtures	1/2	Fall or spring— fall preferred	Normally not used— adapted moist soils in mixtures.
Ryegrass, domestic	24	250,000	10	1/2	Last cultivation of corn	Frequently seeded alone or with sweet clover for winter cover.

Table 4—Continued

Crop	Weight per bushel (pounds)	No. seeds per pound	Seeding rate per acre (pounds)	Planting depth (inches)	Planting date	Remarks
Timothy	45	1,230,000	4-6 in legume mixture	1/2	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— April 1-May 1	
Barley (winter)	48	13,000	72-96	1-2	September 1-15	
Field beans (white pea)	60	2,200-2,400	30-45	2	May 25-June 25 Preferably June 1-5	
Field beans (kidney)	60	900	80	2	June 1-15	
Field beans (cranberry and yelloweye)	60	850-1,125	60	2	June 1-15	
Corn (field)	56	1,300-2,200	10-16	2-3	May 5-June 1	Seeding rate per acre depends upon seed grade and soil productivity.
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 to 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	1/2-1		
Millet, (grain)	50	80,000	10-15	1/2-1	June 1-30	Emergency crop.
Oats	32	13,000	64-80	1-2	Soon as possible in spring— April 1-May 1	
Potatoes	60		30-35 bu. 18-20 bu. per acre of Russet Burbank	4-5	May 15-June 1	
Sorghum (grain)	56	15,000-20,000	3-5	1-2	Same as for forage sorghum	Plant in rows. Present varieties too late maturity.
Soybeans	60	2,300-3,000	45-60	2	May 20-June 10	Plant in rows. If planted solid use 90-120 lbs. seed per acre.
Spelt	30-40		60-120	1-2	September 10-25	
Sugar beets		56,000 (monogerm)	1/2—1-1/4	1/2	April 15-May 30	Seeds per pound depends upon screen size.

Table 4—Continued

Crop	Weight per bushel (pounds)	No. seeds per pound	Seeding rate per acre (pounds)	Planting depth (inches)	Planting time	Remarks
Sunflower	24	3,000-9,000	3-7	1-2	May 10-June 1	
Vetch	60	21,000	15-20	1-2	September 10-October 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	September 10-25	Plant after fly-free date for the area.
Rye	56	18,000	56-84	1-2	September 10-October 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	April	Mix oats and peas in equal amounts.
Ryegrass and sweet clover			10-ryegrass 10-sw. clover	1/2	Last cultivation of corn	Cover crop.

Cooperative extension work in agriculture and home economics, Michigan State University and the U. S. Department of Agriculture cooperating. N. P. Ralston, Director, Cooperative Extension Service, Michigan State University, East Lansing. Printed and distributed under Acts of Congress, May 8 and June 30, 1914.

2P-9:65-15M-MI