

MSU Extension Publication Archive

Archive copy of publication, do not use for current recommendations. Up-to-date information about many topics can be obtained from your local Extension office.

Seeding Practices for Wheat in Michigan

Michigan State University Extension Service

Wheat Facts

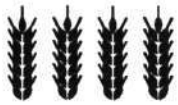
R.W. Ward, L.O. Copeland, Department of Crop and Soil Sciences

Issued August 1994

4 pages

The PDF file was provided courtesy of the Michigan State University Library

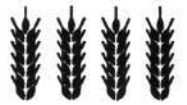
Scroll down to view the publication.



WHEAT



FACTS



SEEDING PRACTICES FOR WHEAT IN MICHIGAN

R.W. Ward and L.O. Copeland
Department of Crop and Soil Sciences

Land Selection and Preparation

Wheat is best adapted to soils that are well drained but have good water holding-capacity. Heavy, poorly drained soils are subject to late winter flooding that can result in poor plant survival. Sandy soils without irrigation do not have the water-holding capacity needed for optimum productivity. The field should be well tilled or have enough slope to provide good surface drainage and be free of quackgrass and other perennial weeds.

Most Michigan wheat growers prepare their fields for planting using conventional tillage methods. The objectives of tillage are to control weeds, incorporate fertilizers and prepare the field for good seed-soil contact. You may do this by plowing and/or disking or dragging. Extensive Michigan State University (MSU) research has shown that direct seeding (minimum and no-tillage) is a workable alternative to conventional practices and produces equivalent and sometimes improved wheat yields. See information below on direct drilling and alternative seeding methods. Also refer to Extension Bulletin E-2418, "Direct Drilling Winter Wheat" (50¢), August 1992.

Method, Depth and Rate of Seeding

Drill wheat in 6- to 8-inch rows about $\frac{3}{4}$ to $1\frac{1}{2}$ inches deep. Planting too deep retards germination and emergence, while planting too shallow increases the risk of winterkill and poor germination. Seeding rate influences winter survival, yield and test weight in Michigan. Similar to corn and

soybeans, the most meaningful way to calibrate planting rates in wheat is in terms of seeds per acre. MSU research indicates that optimal seeding rates range from 1.6 to 2.1 million seeds per acre for seed 90 percent or more germination. Seed lots of the same variety from the same year can vary in seeds per pound, so the use of a constant seeding rate expressed in pounds or bushels per acre *will not* provide constant seeding rates.

Determine the number of seeds per pound in your seed lot and calibrate your drill accordingly (see Table 1) for the relationship between seeds per pound and the number of seeds per acre. Seed counts are available upon request from seed testing laboratories, and seed suppliers should list this information on the seed bag for their customers. Michigan certified wheat seed is evaluated for the number of seeds per pound and this information should be available when the seed is purchased. If this information is not on the tag, ask your seed supplier to provide it to you.

Drills should be calibrated and checked for within and among row uniformity *well in advance* of planting. Table 2 shows how seeds per row-foot varies with targeted seeding rate and row spacing. These numbers also represent a guide to expected stands. Growers should compensate for poor uniformity by increasing seeding rates. Variations in seeding depth or rates will adversely affect yield.

Increased seeding rates can compensate for reduced growth caused by late planting. Planting rates should approach 2.5 million plants per acre when planting after October 15.

Time of Seeding

Plant wheat any time after the Hessian fly-free date which varies throughout Michigan (Table 3). Although delayed planting may in some cases reduce fall disease and insect pressure, it also increases the risk of adverse planting weather, winter kill and increased heat-or disease stress due to delayed time of heading and harvest.

Minimum Tillage, No-Till, Direct Drilling and Aerial Seeding

Growers can drill directly in no-till or minimum tillage situations using proper equipment that will place the seed for good seed-soil contact. Basically, this requires a heavy drill with coulters that open the soil, leaving residue on the surface and a press-wheel that closes the seed opening and firms the drilled furrow. Research at MSU has shown that such seedings, if properly done, give yields equal to those from conventional seedings. For additional information on direct seeding wheat and specific recommendations, refer to Extension Bulletin E-2418, mentioned earlier.

Wheat may also be aerially seeded into a soybean field just before leaf drop. Under such conditions, the falling leaves trap enough moisture in close soil contact with the seed to enable adequate stand establishment. This method can give good results, however, it is more risky than conventional drilling because of moisture uncertainty, the possibility of emergence before the appearance of the last Hessian fly brood and increased risk of winterkill in the event of open winter conditions.

Broadcast Seeding

Avoid aerial seeding or broadcast seeding on bare ground unless you can till the field lightly to provide for seed coverage. It is estimated that 15 to 20 percent of the Michigan wheat acreage is planted to broadcast seed with fertilizer which is then disked or tilled lightly. Although this method is fast and convenient, it lacks precision in seeding rate and is not as certain as conventional drilling. Seeding rates for this method should be increased by about 10 percent to compensate for non-uniform seed germination and emergence.

TABLE 1

The effect of seed size on seeding rate in pounds per acre at different target seeding rates.

Seed size (seeds/lb)	Target seeding rates (millions of seeds/acre)					
	1.6	1.7	1.8	1.9	2.0	2.1
	----- lb of seed/acre -----					
10,000	160	170	180	190	200	210
11,000	145	155	164	173	182	191
12,000	133	142	150	158	167	175
13,000	123	131	138	146	154	162
14,000	114	121	129	136	143	150
15,000	107	113	120	127	133	140
16,000	100	106	113	119	125	131
17,000	94	100	106	111	118	124
18,000	89	94	100	106	111	117

Note: $\frac{\text{Seeds/acre}}{\text{seeds/pound}} = \text{pounds of seed per acre}$

Example: Target seeding rate = 1,800,000 seeds per acre

Seeds per pound = 14,000

Calculate the number of pounds of seed per acre needed:

pounds of seed per acre = $\frac{1,800,000}{14,000}$

pounds of seed per acre = 129

TABLE 2

Number of seeds/foot of row for different combinations of row spacing and target seeding rates.

Desired seeding rate		(row spacing in inches)				
million seeds/A	seeds/ft ²	6	7	8	9	10
		----- seeds/ft of row -----				
1.6	37	18.4	21.4	24.5	27.5	30.6
1.8	41	20.7	24.1	27.5	31.0	34.4
2.0	46	23.0	26.8	30.6	34.4	38.3
2.2	51	25.3	29.4	33.6	37.9	42.1
2.4	55	27.5	32.1	36.7	41.3	45.9
2.6	60	29.8	34.8	39.7	44.8	49.7
2.8	64	32.1	37.5	42.8	48.2	53.6

TABLE 3

Hessian fly-free dates for Michigan.

County	Earliest seeding date (Sept.)	County	Earliest seeding date (Sept.)	County	Earliest seeding date (Sept.)	County	Earliest seeding date (Sept.)
Alcona	6	Eaton	16	Lapeer	15	Ogemaw	10
Allegan	20	Emmet	4	Leelanau	8	Osceola	10
Alpena	9	Genesee	17	Lenawee	25	Oscoda	7
Antrim	4	Gladwin	12	Livingston	16	Otsego	6
Arenac	13	Grand Traverse	8	Macomb	18	Ottawa	19
Barry	18	Gratiot	15	Manistee	13	Presque Isle	8
Bay	14	Hillsdale	19	Mason	13	Roscommon	7
Benzie	16	Huron	13	Mecosta	12	Saginaw	16
Berrien	23	Ingham	17	Midland	15	Sanilac	15
Branch	19	Ionia	16	Missaukee	9	St. Clair	16
Calhoun	19	Iosco	7	Monroe	21	St. Joseph	23
Cass	22	Isabella	11	Montcalm	15	Shiawassee	16
Charlevoix	3	Jackson	16	Montmorency	7	Tuscola	15
Cheboygan	4	Kalamazoo	20	Muskegon	18	Van Buren	22
Clare	12	Kalkaska	5	Newaygo	15	Washtenaw	18
Clinton	17	Kent	18	Oakland	16	Wayne	18
Crawford	6	Lake	13	Oceana	16	Wexford	9

This bulletin is part of a series that is being prepared for Michigan wheat producers.
Check with your local MSU Extension Office for availability.

- Wheat variety and seed selection
- Seeding practices for wheat in Michigan
- Direct drilling and minimum tillage for wheat
- Growth stages and wheat management
- Wheat fertility and fertilization
- Weed control in wheat
- Insect control in wheat
- Wheat diseases and their control
- Harvesting and storage of wheat
- Wheat quality and basis of elevator discounts



MSU is an Affirmative-Action Equal-Opportunity Institution. Extension programs and materials are available to all without regard to race, color, national origin, sex, disability, age or religion. ■ Issued in furtherance of Extension work in agriculture and home economics, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Gail L. Imig, extension director, Michigan State University, E. Lansing, MI 48824. ■ This information is for educational purposes only. References to commercial products or trade names does not imply endorsement by the MSU Extension or bias against those not mentioned. This bulletin becomes public property upon publication and may be printed verbatim with credit to MSU. Reprinting cannot be used to endorse or advertise a commercial product or company. Produced by Outreach Communications and printed on recycled paper using vegetable-based inks.



New 8:94-2.5M -KMF-SP, 50¢, single copy free to Michigan residents. FILE: 22.17, Field Crops-Wheat
