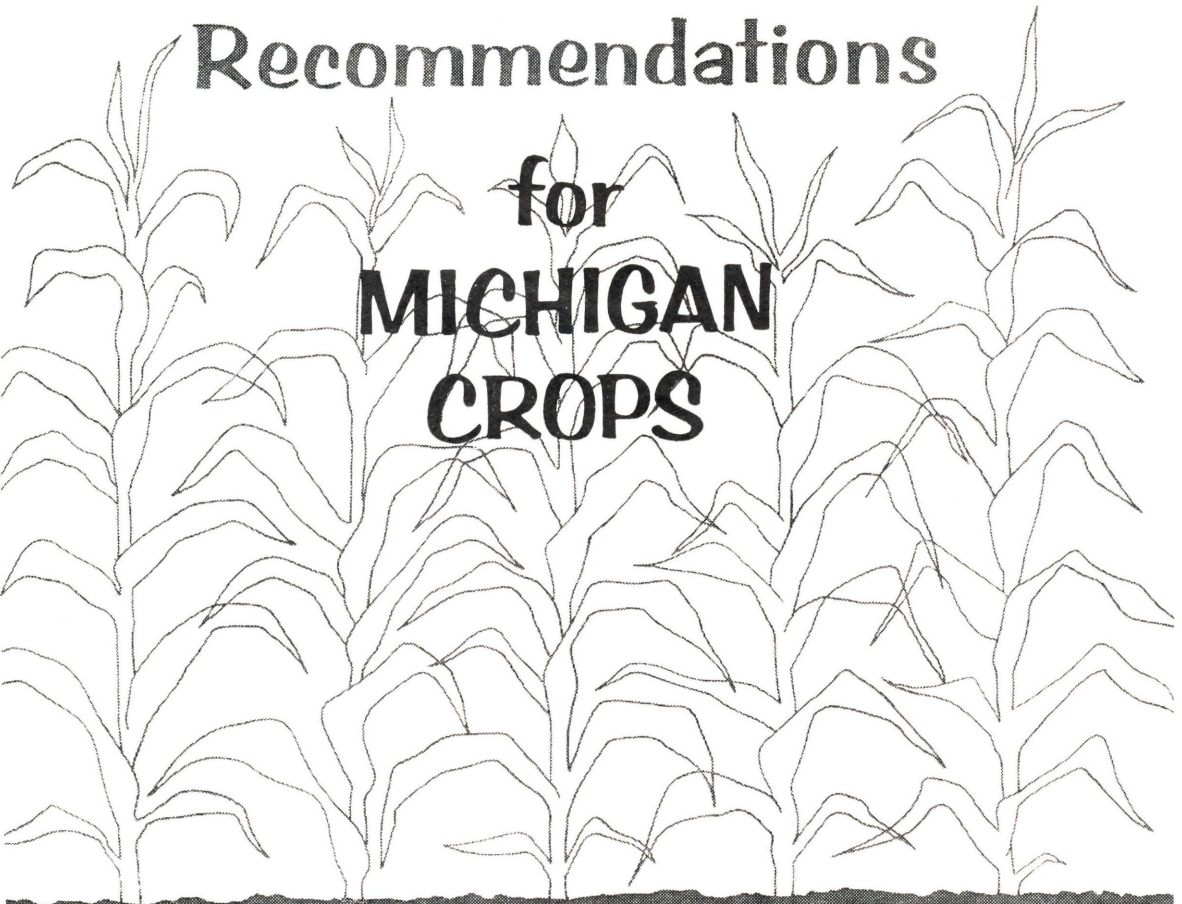
Fertilizer Recommendations - Supplement
Michigan State University Extension Service
Soil Science and Horticulture
Revised March 1958
6 pages

EXTENSION BULLETIN 159 — SUPPLEMENT MARCH 1958

Supplement to

FERTILIZER Recommendations for MICHIGAN CROPS



Prepared by Department of Soil Science

MICHIGAN STATE UNIVERSITY

Cooperative Extension Service • East Lansing

Supplement to
Fertilizer Recommendations for Michigan Crops

This publication is designed to serve as a supplement to Extension Bulletin 159 (Revised), October, 1957, entitled "Fertilizer Recommendations for Michigan Crops."

In fertilizer language, "ratio" expresses the relationship between the three major plant nutrients (N, P_2O_5, and K_2O). Grade or analysis indicates the pounds of each of the three major plant nutrients per 100 pounds of fertilizer. Thus, 5-20-10 is a grade of fertilizer having a 1:4:2 ratio.

Michigan Cooperative Extension service staff members and other agronomist and services will usually make fertilizer recommendations as a given number of pounds per acre of a given grade of fertilizer, such as 300 pounds of 5-20-10. However, the recommendations may also be expressed in terms of a given number of pounds per acre of each of the three major plant nutrients and written 15+60+30. (Note the + sign between the numbers rather than the - sign.)

If a given number of pounds per acre of a certain grade of fertilizer is recommended, it may be that your fertilizer dealer cannot supply that grade. But he can, very likely, supply a grade of similar ratio which is just as good. However, you will need either fewer or more pounds to supply the same amount of plant nutrients, depending on their concentration.

Here are the steps in using the following tables.

RATIO — 0:1:0

Recommended	*Alternatives*
125 lb. 0-20-0	140 lb. 0-18-0 55 lb. 0-45-0 55 lb. 0-46-0 55 lb. 0-47-0
300 lb. 0-20-0	330 lb. 0-18-0 130 lb. 0-45-0 130 lb. 0-46-0 130 lb. 0-47-0
400 lb. 0-20-0	450 lb. 0-18-0 175 lb. 0-45-0 175 lb. 0-46-0 175 lb. 0-47-0

RATIO — 0:1:1

To supply	*Use*
0+20+20	100 lb. 0-20-20 80 lb. 0-25-25
0+30+30	150 lb. 0-20-20 120 lb. 0-25-25

RATIO — 0:2:1 (Continued)

To supply	*Use*
0+60+30	300 lb. 0-20-10 215 lb. 0-28-14 190 lb. 0-32-16 150 lb. 0-40-20
0+80+40	400 lb. 0-20-10 290 lb. 0-28-14 250 lb. 0-32-16 200 lb. 0-40-20

RATIO — 1:1:1

To supply	*Use*
16+16+16 20+20+20	200 lb. 8-8-8, 9-9-9 or 10-10-10 150 lb. 11-11-11, 12-12-12 or 13-13-13 120 lb. 15-15-15
	310 lb. 8-8-8, 9-9-9 or 10-10-10

RATI

To supply
5+10+10
7½+15+15 8+16+16 10+20+20
12½+25+25 15+30+30 16+32+32
20+40+40 25+50+50
30+60+60 35+70+70

A. Recommendations made as pounds per acre of a certain grade of fertilizer, such as 300 pounds 5-20-10:

1. Determine the ratio between the plant nutrients (5-20-10 is a 1:4:2 ratio).
2. Refer to the section of this leaflet having that ratio heading.
3. Locate your recommendation in the right-hand column.
4. Any other recommendation in the same bracket will be just as good.

B. Recommendation made as pounds per acre of each of the three plant nutrients, such as 15+60+30:

1. Determine the ratio between the plant nutrients
2. Refer to the section of this leaflet having that ratio heading.
3. Locate your recommendation in the left-hand column.
4. In the opposite bracket in the right-hand column you will find all the grades of this ratio offered for sale in Michigan, with the rate of application required to supply the recommended amounts of plant nutrients.

Three exceptions to the above procedure involve the 0:1:0 ratio, the 0:1:2 ratio, and the 1:4:0 ratio. None of these ratios is a first choice, but they are suggested as alternatives. In these three sections of the leaflet, the quantities of 0-20-0, 0-15-30, or 8-24-0 appear in the left-hand column with the various alternatives or substitutions in the right-hand column.

- 1:2:2

Use	
100 lb.	5-10-10
83 lb.	6-12-12
63 lb.	8-16-16
50 lb.	10-20-20
175 lb.	5-10-10
150 lb.	6-12-12
110 lb.	8-16-16
90 lb.	10-20-20
285 lb.	5-10-10
240 lb.	6-12-12
180 lb.	8-16-16
145 lb.	10-20-20
450 lb.	5-10-10
380 lb.	6-12-12
280 lb.	8-16-16
225 lb.	10-20-20
650 lb.	5-10-10
540 lb.	6-12-12
410 lb.	8-16-16

RATIO — 1:4:0

Recommended		*Alternatives*	
70 lb. 8-32-0 100 lb. 8-32-0	55 lb.	11-48-0 20-52-0 21-52-0 21-53-0	
125 lb. 8-32-0 150 lb. 8-32-0	90 lb.	11-48-0 20-52-0 21-52-0 21-53-0	
200 lb. 8-32-0 225 lb. 8-32-0 250 lb. 8-32-0	145 lb.	11-48-0 20-52-0 21-52-0 21-53-0	
250 lb. 8-32-0 300 lb. 8-32-0	175 lb.	11-48-0 20-52-0 21-52-0 21-53-0	
500 lb. 8-32-0	320 lb.	11-48-0 20-52-0 21-52-0 21-53-0	

RATIO — 1:4:4 (Continued)

To supply	*Use*
30+120+120	1080 lb. 3-12-12
35+140+140	810 lb. 4-16-16
	650 lb. 5-20-20
	540 lb. 6-24-24
40+160+160	1500 lb. 3-12-12
50+200+200	1125 lb. 4-16-16
	900 lb. 5-20-20
	750 lb. 6-24-24

RATIO — 1:6:3

To supply	*Use*
6+36+18	200 lb. 3-18-9
	150 lb. 4-24-12
12+72+36	400 lb. 3-18-9
	300 lb. 4-24-12
16+96+48	533 lb. 3-18-9
	400 lb. 4-24-12

RATIO — 2:1:1

0+40+40 0+45+45	210 lb. 0-20-20 170 lb. 0-25-25
0+60+60	300 lb. 0-20-20 240 lb. 0-25-25
0+80+80	400 lb. 0-20-20 320 lb. 0-25-25

RATIO — 0:1:2

Not sold in Michigan now. Substitute 0:1:3 ratio for legumes on mineral soils and 1:2:4 ratio for crops on organic soils.

Recommended	*Alternatives*
100 lb. 0-15-30	100 lb. 0-10-30 84 lb. 0-12-36 77 lb. 0-13-39
135 lb. 0-15-30 150 lb. 0-15-30	140 lb. 0-10-30 120 lb. 0-12-36 110 lb. 0-13-39
200 lb. 0-15-30	200 lb. 0-10-30 167 lb. 0-12-36 155 lb. 0-13-39
270 lb. 0-15-30 300 lb. 0-15-30	285 lb. 0-10-30 240 lb. 0-12-36 220 lb. 0-13-39

RATIO — 0:1:3

To supply	*Use*
0+15+45	150 lb. 0-10-30 125 lb. 0-12-36 115 lb. 0-13-39
0+30+90	300 lb. 0-10-30 250 lb. 0-12-36 230 lb. 0-13-39

RATIO — 0:2:1

To supply	*Use*
0+30+15	150 lb. 0-20-10 110 lb. 0-28-14 95 lb. 0-32-16 75 lb. 0-40-20
0+40+20	200 lb. 0-20-10 145 lb. 0-28-14 125 lb. 0-32-16 100 lb. 0-40-20
25+25+25 30+30+30	230 lb. 11-11-11, 12-12-12 or 13-13-13 180 lb. 15-15-15
40+40+40	444 lb. 8-8-8, 9-9-9 or 10-10-10 333 lb. 11-11-11, 12-12-12 or 13-13-13 267 lb. 15-15-15
50+50+50 60+60+60	610 lb. 8-8-8, 9-9-9 or 10-10-10 460 lb. 11-11-11, 12-12-12 or 13-13-13 367 lb. 15-15-15
70+70+70	780 lb. 8-8-8, 9-9-9 or 10-10-10 585 lb. 11-11-11, 12-12-12 or 13-13-13 470 lb. 15-15-15
150+150 +150	1670 lb. 8-8-8, 9-9-9 or 10-10-10 1250 lb. 11-11-11, 12-12-12 or 13-13-13 1000 lb. 15-15-15

RATIO — 1:2:1

To supply	*Use*
12½+25+12½ 15+30+15	280 lb. 5-10-5 140 lb. 10-20-10
16+32+16 20+40+20	360 lb. 5-10-5 180 lb. 10-20-10
25+50+25	500 lb. 5-10-5 250 lb. 10-20-10
30+60+30	600 lb. 5-10-5 300 lb. 10-20-10
40+80+40	800 lb. 5-10-5 400 lb. 10-20-10
50+100+50 60+120+60	1100 lb. 5-10-5 550 lb. 10-20-10
40+80+80 50+100+100	
60+120+120	

RATI

To supply	
5+10+20	
8+16+32	
10+20+40	
12½+25+50	
15+30+60	
20+40+80	
25+50+100	
30+60+120	
35+70+140	
40+80+160	
50+100+200	

RATI

Not sold in M

1:4:4.

To supply	
12+36+36	
16+48+48	

RATI

To supply	
5+15+45	
15+45+135	

000 lb. 5-10-10
750 lb. 6-12-12
560 lb. 8-16-16
450 lb. 10-20-20

200 lb. 5-10-10
000 lb. 6-12-12
750 lb. 8-16-16
600 lb. 10-20-20

- 1:2:4

Use

100 lb. 5-10-20
160 lb. 5-10-20
200 lb. 5-10-20
250 lb. 5-10-20
300 lb. 5-10-20
400 lb. 5-10-20
500 lb. 5-10-20
600 lb. 5-10-20
700 lb. 5-10-20
800 lb. 5-10-20
1000 lb. 5-10-20

- 1:3:3

igan. Substitute

Use

300 lb. 3-12-12
225 lb. 4-16-16
180 lb. 5-20-20
150 lb. 6-24-24

400 lb. 3-12-12
300 lb. 4-16-16
240 lb. 5-20-20
200 lb. 6-24-24

- 1:3:9

Use

170 lb. 3-9-27

500 lb. 3-9-27

Note - In the above substitutions for the 8-32-0, the 11-48-0 is the most similar. The higher nitrogen materials such as the 21-52-0 should be used only if past management or crop appearance indicates that this much nitrogen can be used to advantage.

RATIO – 1:4:1

Not sold in Michigan now. For high potash requirement crops, use a 1:4:2 ratio fertilizer. For low potash requirement crops, use a 1:4:0 or similar fertilizer (8-32-0; 11-48-0; 20-52-0; 21-52-0; 21-53-0).

RATIO – 1:4:2

To supply	*Use*
5+20+10	125 lb. 5-20-10
7½+30+15	105 lb. 6-24-12
10+40+20	200 lb. 5-20-10
	170 lb. 6-24-12
12+48+24	250 lb. 5-20-10
12½+50+25	210 lb. 6-24-12
15+60+30	300 lb. 5-20-10
	250 lb. 6-24-12
20+80+40	450 lb. 5-20-10
25+100+50	375 lb. 6-24-12
30+120+60	600 lb. 5-20-10
	500 lb. 6-24-12
35+140+70	700 lb. 5-20-10
	585 lb. 6-24-12
40+160+80	800 lb. 5-20-10
	670 lb. 6-24-12
50+200+100	1000 lb. 5-20-10
	835 lb. 6-24-12

RATIO – 1:4:4

To supply	*Use*
10+40+40	420 lb. 3-12-12
12½+50+50	315 lb. 4-16-16
15+60+60	250 lb. 5-20-20
	210 lb. 6-24-24
20+80+80	750 lb. 3-12-12
25+100+100	560 lb. 4-16-16
	450 lb. 5-20-20
	375 lb. 6-24-24

50+25+25	500 lb. 10-6-4
	420 lb. 12-6-6
	360 lb. 14-7-7
	310 lb. 16-8-8
70+35+35	700 lb. 10-6-4
	580 lb. 12-6-6
	500 lb. 14-7-7
	440 lb. 16-8-8
150+75+75	1500 lb. 10-6-4
	1250 lb. 12-6-6
	1070 lb. 14-7-7
	940 lb. 16-8-8

RATIO – 2:1:2

To supply	*Use*
50+25+50	625 lb. 8-4-8
	420 lb. 12-6-12
70+35+70	875 lb. 8-4-8
	585 lb. 12-6-12
150+75+150	1900 lb. 8-4-8
	1250 lb. 12-6-12

RATIO – 2:2:1

To supply	*Use*
20+20+10	100 lb. 5-20-10 plus 15 lb. actual nitrogen
30+30+15	150 lb. 5-20-10 plus 25 lb. actual nitrogen
40+40+20	200 lb. 5-20-10 plus 30 lb. actual nitrogen
50+50+25	250 lb. 5-20-10 plus 40 lb. actual nitrogen
60+60+30	300 lb. 5-20-10 plus 45 lb. actual nitrogen
70+70+30	350 lb. 5-20-10 plus 55 lb. actual nitrogen
150+150+75	750 lb. 5-20-10 plus 115 lb. actual nitrogen

Cooperative extension work in agriculture and home economics. Michigan State University and the U. S. Department of Agriculture cooperating. Paul A. Miller, Director, Cooperative Extension Service, Michigan State University, East Lansing. Printed and distributed under Acts of Congress, May 8 and June 30, 1914. 3:58—15M