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# FERTILIZER RECOMMENDATIONS FOR 1944

## Fertilizer Grades Authorized for Sale in Michigan

0-12-12	0-9-27	3-18-9
0-14-14	2-16-8	4-10-6
0-20-20	2-12-6	4-16-4
0-10-20	3-9-18	4-12-4
0-14-7	3-12-12	10-6-4
0-20-10		8-8-8

Superphosphate—18% phosphoric acid or higher  
 Muriate of potash—50% potash or higher  
 Sulfate of potash—48% potash or higher  
 Mine-run potash or "manure salts" 22-26% potash. Also contains 50-56% salt.  
 Ammonium nitrate—32-35% nitrogen  
 Nitrate of soda—16% nitrogen  
 Some other materials carrying nitrogen, phosphoric acid, or potash may be sold.  
 Victory garden fertilizer 4-12-4

PREPARED BY  
 DEPARTMENTS OF SOIL SCIENCE  
 AND HORTICULTURE

MICHIGAN STATE COLLEGE :: EXTENSION DIVISION  
 EAST LANSING

Michigan State College of Agriculture and Applied Science and U. S. Dept. of Agriculture co-operating, R. J. BALDWIN, DIRECTOR EXTENSION DIVISION, Michigan State College, East Lansing. Printed and distributed under acts of Congress, May 8 and June 30, 1914.

## FERTILIZER FACTS

### 1. FERTILIZER SUPPLIES

The fertilizer industry is putting forth every effort to produce as much fertilizer as possible in order to supply their customers' requirements and to assist in food production for victory and peace. Indications are that there will be a considerably greater total supply of fertilizer than ever before. Nevertheless, farmers will doubtless wish to buy more fertilizer than is available. There will be somewhat less potash than was available last year because of the necessity of supplying some to our allies and of increased needs for the manufacture of munitions. Bearing this situation in mind, fertilizer purchasers will be asked, in many cases, to use grades containing somewhat less potash than usual; on very fertile soils and for some crops, straight superphosphate (18-20 per cent) may well be used.

### 2. USE FERTILIZER WISELY

It is estimated that fertilizers will be responsible for from 20 to 25 per cent of the quantity of food produced, considering the country as a whole. It is essential, therefore, that fertilizer supplies be used *wisely*. Although it may not be feasible to supply all crops with as much potash as is normally used, it is advisable for key crops which require abundant potash and particularly when grown on soils markedly deficient in potash, to use fertilizer grades containing ample potash. Some examples are, essential vegetables on muck soil, alfalfa and clover on light loams and sandy soils, potatoes, sugar beets.

Farmers are also urged to increase the use of fertilizers on those crops which respond especially well to applications of plant food, even if this means a lowered rate of application on crops which do not give such consistent increases in yield as a result of fertilization.

### 3. BUY FERTILIZER EARLY

Fertilizer manufacturers are working under the same labor shortage as are farmers. Trucking facilities are decreased and storage facilities are overtaxed, since manufacturers must take raw materials when they can get them and not necessarily just when they are needed. All this sums up to the fact that farmers must order fertilizer at once and take delivery during the winter in place of waiting until spring.

### 4. APPLICATIONS FOR FERTILIZER

Purchasers of fertilizer other than "Victory Garden Fertilizer" or "Speciality Fertilizer" must file a written request for the same with the dealer. Among other statements, the request must list the crops to be fertilized, the acreage of each crop, the grade of fertilizer desired, the pounds of fertilizer to be applied per acre and total quantities needed. Application blanks may be obtained from the local dealer.

### 5. VICTORY GARDEN FERTILIZER

Victory gardeners may use Victory Garden Fertilizer (4-12-4) which may be sold in packages varying from small to large. In addition, there may have been some 3-8-7, "Victory Garden Fertilizer" left over from last year which also may be sold for use on gardens.

Victory gardeners may also use *any* grade of fertilizer on sale in the state if purchased in bags containing 80 pounds or more.

### 6. SPECIALITY FERTILIZERS

On lawns, golf courses, parks, cemeteries, roadsides, or non-commercial plantings of trees, shrubs or flowers, may be used a "Speciality" fertilizer put out by different companies for that purpose. No fertilizer except a "Speciality" grade may be used for this purpose.

## HEAVY LOAMS, SILT LOAMS AND CLAY LOAMS

Crops	Dark-colored soils (high in humus)	Rates of application and suggestions	Yellowish brown to grayish brown soils (Medium to low in humus)
	Grades recommended		Grades recommended
Alfalfa	Superphosphate 18-20%	300 pounds or more. Apply fertilizer when seeding and after second year	0-14-7, 0-20-10
Barley, oats	Superphosphate 18-20%. 0-14-7, 2-16-8, 2-12-6	200-300 pounds. If legume is seeded, 300-400 pounds	2-16-8, 2-12-6. If manured, use super- phosphate 18-20%
Beans	0-14-7, 2-16-8, 0-20-10	200-300 pounds. Apply 1 inch to the side and 1½ inches below seed. Otherwise, do not fertilize	2-16-8, 2-12-6
Corn	Superphosphate 18-20%. 2-16-8, 2-12-6	Fertilizer hastens early growth, but usually does not greatly in- crease yield of grain	2-16-8, 2-12-6. If manured, use 18- 20% superphos- phate
Chicory	2-16-8, 2-12-6	Apply beside and below seed. Not more than 200 pounds with seed. Use 5-10 pounds borax per acre	2-16-8, 2-12-6
Potatoes, early	4-10-6, 4-16-4	400-600 pounds. In a few cases up to 1000 pounds may be ad- visable. Place 2 inches to side of seed	4-10-6
Potatoes, late	2-16-8, 2-12-6		2-12-6, 3-12-12
Sugar beets	2-16-8, 2-12-6	300-500 pounds. Apply 1 inch to side and 1½ inches below seed. Not more than 200 pounds with the seed is safe. Use 5-10 pounds borax per acre	2-16-8, 2-12-6
Wheat, rye	Superphosphate 18-20%. 0-14-7, 2-12-6	200-300 pounds. If legume is to be seeded in, use 300-400 pounds	2-16-8, 2-12-6
Peas, canning	0-14-7, 2-16-8	200-300 pounds per acre	2-16-8, 2-12-6
Corn, canning	0-14-7, 2-12-6	150-200 pounds per acre	2-16-8, 2-12-6
Tomatoes, canning	Superphosphate 18-20%. 4-16-4	400-800 pounds per acre	4-16-4, 2-16-8
Red beets	2-16-8, 2-12-6	300-500 pounds. Apply 1 inch to side and 1½ inches below seed, or broadcast before plant- ing. Use 20 pounds borax with fertilizer beside seed or 40 pounds broadcast	2-12-6, 2-16-8

## HEAVY LOAMS, SILT LOAMS AND CLAY LOAMS—Continued

Crops	Dark-colored soils (high in humus)	Rates of application and suggestions	Yellowish brown to grayish brown soils (Medium to low in humus)
	Grades recommended		Grades recommended
Soybeans	0-14-7, 2-16-8	Apply 1 inch to the side and below the seed—none with seed	2-16-8, 2-12-6
Market gardens	4-16-4, 4-10-6, 2-16-8, 2-12-6	400-1000 pounds per acre. Apply 200-300 pounds 1-2 inches to the side of and below seed. Plow under the remainder	4-10-6, 4-16-4
Home gardens	2-12-6, 4-10-6, Victory Garden Fertilizer (4-12-4)	10-20 pounds per 1000 square feet of garden area. For economy purchase in 80 pound bags or larger	4-10-6, Victory Garden Fertilizer (4-12-4)
Cabbage, spinach, lettuce and similar crops	2-12-6, 2-16-8, 4-16-4	400-800 pounds per acre. On early crop during cool wet seas- ons, sidedress with nitrogen fertilizer	4-16-4, 4-10-6, 2-12-6
Pepper, eggplant	2-12-6, 2-16-8	300-500 pounds per acre	4-10-6, 4-16-4
Carrots and other roots	2-12-6, 2-16-8	500 pounds. Apply beside seed or broadcast before planting	4-10-6, 2-12-6
Pickles, melons, squash, etc.	Superphosphate 18-20%. 4-16-4	250-500 pounds per acre	4-10-6, 4-16-4
Snap beans	2-12-6, 0-14-7	200-400 pounds. Apply 1 inch to the side and below seed level —none with the seed	2-12-6, 2-16-8
Radish seed	2-12-6, 2-16-8	250-500 pounds. Do not apply more than 150 pounds in the row	2-12-6, 2-16-8
Tree fruits	Ammonium nitrate Nitrate of soda	2-3½ pounds per tree. If nitrate of soda is used apply 4-7 pounds per tree. Use less for small or very vigorous trees; use none the year trees are planted	Ammonium nitrate Nitrate of soda
Small fruits	Ammonium nitrate Nitrate of soda	200-500 pounds per acre	Ammonium nitrate Nitrate of soda
Strawberries	4-16-4	200-500 pounds. Apply after harvest on old beds. For new beds, apply before planting and topdress in early September with 100 pounds nitrogen fertilizer	4-16-4

## LOAMS, SANDY LOAMS AND SANDS

Crops	Light loams and heavy sandy loams	Rates of application and suggestions	Sandy loams and sands
	Grades recommended		Grades recommended
Alfalfa	0-12-12, 0-14-7	250-350 pounds. Apply fertilizer when seeding and after second year	0-12-12, 0-10-20
Barley, oats	0-12-12, 2-12-6	200-300 pounds. If legume is seeded use 0-12-12 at 300 pounds rate	2-12-6 or 3-12-12. seeding of legume not recommended
Beans	Crop recommended on better soils only, 0-12-12, 0-14-7	200 pounds. Apply 1 inch to the side and 1½ inches below seed. None with seed	Crop not recommended
Soybeans	Crop recommended on better soils only, 0-14-7, 2-16-8	200 pounds. Apply 1 inch to the side and 1½ inches below seed. None with seed	-- Crop not recommended
Corn	2-16-8, 2-12-6	100-200 pounds. Fertilizer hastens early growth, but usually does not greatly increase yield of grain	2-12-6, 2-16-8
Potatoes, early	4-10-6, 3-12-12	500-600 pounds. Apply in bands at side of seed piece. In special cases, especially under irrigation, up to 1000 pounds may be used	4-10-6, 3-12-12
late	3-12-12		3-12-12, 3-9-18
Sugar beets	Crop recommended on better soils only, 3-12-12	300-500 pounds. Place 1 inch to side and 1½ inches below seed. Not over 200 pounds with the seed is safe. Use 5-10 pounds borax per acre	Crop not recommended
Wheat, rye	2-12-6, 2-16-8	300 pounds drilled at seeding. Topdress in winter with manure	3-12-12
Peas, canning	0-12-12, 3-12-12	200-300 pounds per acre	Crop not recommended
Corn, canning	4-16-4, 2-16-8, 3-12-12	100-200 pounds in row with planter and 200 pounds plowed under	3-12-12
Red beets	2-12-6, 2-16-8	400 pounds. Place beside and below seed or broadcast before planting. Broadcast 40 pounds borax or drill 20 pounds beside seed with fertilizer	2-12-6, 3-12-12
Tomatoes	4-10-6, 4-16-4, 3-12-12	500-1000 pounds. Apply 300 pounds 2 inches to side of root cluster and plow under remainder	4-10-6, 3-12-12
Tree fruits	Ammonium nitrate Nitrate of soda	2-3½ pounds per tree. If nitrate of soda is used, apply 4-7 pounds per tree. Use less for small or very vigorous trees and none the year trees are planted	Ammonium nitrate Nitrate of soda

## LOAMS, SANDY LOAMS AND SANDS—Continued

Crops	Light loams and heavy sandy loams	Rates of application and suggestions	Sandy loams and sands
	Grades recommended		Grades recommended
Small fruits	Ammonium nitrate Nitrate of soda	200-500 pounds per acre	Ammonium nitrate Nitrate of soda
Strawberries	4-16-4	200-500 pounds. Apply after harvest on old beds. For new beds, apply before planting and topdress in early September with 100 pounds nitrogen fertilizer	4-16-4
Market gardens	4-10-6, 2-16-8, 2-12-6	500-1200 pounds. Apply 200-300 pounds 1 to 2 inches to the side of and below seed. Plow under remainder	3-12-12, 4-10-6
Home gardens	4-10-6, 2-16-8 or Victory Garden Fertilizer (4-12-4)	15-25 pounds per 1000 square feet of garden area. For economy purchase in 80 pound bags or larger	4-10-6, 3-12-12 or Victory Garden Fertilizer (4-12-4)
Cabbage, spinach, lettuce, and similar crops	4-10-6, 3-12-12	400-800 pounds. Side-dressing with nitrogen fertilizer during growth is desirable	3-12-12, 4-10-6
Peppers, eggplant	4-10-6	300-600 pounds. Apply largely in row	4-10-6
Carrots and other roots	2-16-8, 2-12-6	500 pounds. Apply beside seed or broadcast before planting	3-12-12
Pickles <sup>1</sup> , melons, squash	4-16-4, 4-10-6	400-600 pounds. For early market, mix 200-300 pounds with soil in hills and broadcast remainder before planting. Cucumbers for pickling, broadcast fertilizer before planting	4-10-6, 3-12-12
Snap beans	3-12-12, 4-10-6	300-500 pounds. Apply 1 inch to the side and 1½ inches below seed. None with seed	3-12-12
Radish seed	2-16-8, 2-12-6	250-500 pounds. Do not apply over 150 pounds in the row	2-12-6
Asparagus	In nursery beds	500 to 800 pounds 4-10-6 or 3-12-12 per acre before planting plus topdressing of 100 pounds ammonium nitrate	
	Established plantings	700 to 1000 pounds 0-10-20 before cutting begins. Also apply 300 pounds ammonium nitrate, half before cutting begins and half at end of cutting season. On young beds, half the foregoing applications is enough	

<sup>1</sup>In cool, wet seasons pickles should be side-dressed with 100-200 pounds of nitrogen fertilizer.





	0	5	10	3-9-18	0-9-27	Lettuce	500-800	0-10-20	3-12-12	15	5	0
0	0	0	5	3-12-12 3-18-9	0-10-20 0-12-12	Mint	300-600	0-10-20 0-12-12	3-12-12 3-18-9	0	0	0
0	0	5	5	3-12-12 3-18-9	0-10-20 3-9-18 0-12-12	Onions	800-1600	0-12-12 3-9-18 0-20-20	3-12-12 3-18-9	5-15	0	0
0	0	2.5	2.5	3-9-18	0-9-27	Parsnips	600-1000	0-9-27	3-9-18	5-10	5	0
0	0	2.5	2.5	3-9-18	0-9-27	Potatoes	600-1200	0-9-27	3-9-18	10-15	0	0
0	0	2.5	2.5	0-12-12	0-9-27	Pumpkins, squash	300-600	0-9-27	3-9-18	15	0	0
100-200	2.5	2.5	2.5	3-9-18	0-9-27	Radishes	400-800	0-9-27	3-9-18	15	5	100-200
0	5	10	10	3-9-18	0-9-27	Spinach	600-1000	0-10-20	3-9-18	10-15	5	0
0	5	0	0	3-12-12	0-10-20	Sweet corn	500-800	0-10-20	3-12-12	10	5	0
500-1000	2.5-5	5	5	3-9-18	0-9-27	Table beets, Swiss chard	600-1000	0-9-27 0-10-20	3-9-18	5-15	10	500
0	0	5	5	3-12-12	0-9-27	Tomatoes	600-1000	0-10-20	3-12-12	5-10	0	0
500	2.5-5	5	5	0-10-20	0-9-27	Turnips, rutabagas	300-500	0-9-27	0-10-20	10-15	5	500
0	5	0	0	3-9-18	0-9-27	Corn, field	250-500	0-9-27	3-9-18	15	5	0
0	0	5	5	.....	0-9-27	Grain	250-400	0-9-27	.....	15	0	0
500-1000	2.5	5	5	3-9-18	0-9-27	Sugar beets, mangels	300-700	0-9-27	3-9-18	0	5	500-1000
0	0	5	5	0-9-27	0-9-27	Permanent pasture	100-150	0-9-27	0-9-27	0	0	0
0	0	2.5	2.5	3-9-18	0-9-27	Timothy and alsike, brome grass	200-350	0-9-27	3-9-18	15	0	0
0	0	2.5	2.5	3-9-18	0-9-27	Reed canary grass	300-400	0-9-27	3-9-18	15	0	0

## MUCK SOIL—Continued

Salt (pounds per acre)	Acid Muck Soils (pH 6.5 or less)			Crop and Rate of Fertilization			Alkaline and Faintly Acid Muck (pH 6.6 or more)			Salt (pounds per acre)	
	Fertilizer analysis for mucks of good and poor drainage. Per- centage minor plant foods in fertilizer mixture			Crop**	Pounds per acre	Fertilizer analysis		Fertilizer analysis for mucks of good and poor drainage. Per- centage minor plant foods in fertilizer mixture			
	Per cent in fertilizer***	Fertilizer analysis				Good drain- age	Poor drain- age	Per cent in fertilizer***	Per cent in fertilizer***		
Borax	Copper sul- phate	Good drain- age	Good drain- age	Good drain- age	Manga- nese sulphate	Borax					
0	0	5	0-10-20	0-9-27	Soybeans, sweet clover	200-350	0-9-27	0-10-20	15	0	0
0	0	5	3-9-18	0-9-27	Sudan grass, Hungarian millet	200-300	0-9-27	3-9-18	15	0	0
0	0	2.5	3-9-18	0-9-27	Blueberries	500-800	.....	.....	.....	.....	.....
0	0	2.5	3-9-18	0-9-27	Raspberries	500-800	0-9-27	3-9-18	15	0	0
0	0	5	0-12-12	0-12-12	Strawberries	200-400	0-12-12	0-12-12	0	0	0

\*Where two crops are produced on the same field in one growing season, the maximum fertilization for the year should be not more than the maximum recommended for the first crop plus two-thirds of the maximum recommended for the second crop.

\*\*Side-dressings of an available nitrogen carrier may be required during growth on the following crops: Broccoli, cabbage, cauliflower, 100 to 150 pounds per acre. Celery, 150 to 400 pounds. Topdressings of available nitrogen following exceptionally wet weather may be required on the following crops: Lettuce, mint, onions, radishes, spinach, table beets, Swiss chard, 100 to 200 pounds per acre.

\*\*\*Where a range in percentage of minor plant food elements is given, the percentage which should be used depends on the rate of application of fertilizer and on the degree of acidity or alkalinity of the soil.

## NOTES REGARDING MUCK LAND FERTILIZATION AND CROPPING

Crop	Remarks	Crop	Remarks
Broccoli Cabbage Cauliflower Lettuce Spinach Swiss chard	Apply fertilizer in 7" drills before seeding or transplanting. For cabbage and cauliflower transplanted to wet muck, 400 to 500 pounds per acre can be applied in row 4" deep. These six crops responsive to manure, supplemented with 0-9-27 fertilizer.	Field corn Sweet corn	Fertilize in 7" drills 4" deep. Applied in row, not more than 200 pounds for field corn and 400 pounds for sweet corn should be used.
Celery Radishes Table beets	Nitrogen advisable in fertilizer mixture for early crops. Celery responsive to manure, supplemented with commercial fertilizer. In absence of manure, side-dress celery with available nitrogen fertilizer.	Grain	Apply fertilizer in 7" drills 4" deep. Grow varieties adapted to muck, as Peatland barley, Gopher oats and Rosen rye.
Onions	Row application 400 to 500 pounds 2 inches below seed advisable on moist muck. Try 3-12-12 or 3-18-9 if crop is generally slow in maturing.	Pasture	Apply fertilizer broadcast in spring. Growth increase, and palatability and nutritive value much improved by proper fertilization.
Mint	Fertilizer needed to maintain stand, as well as to increase oil content. Try 0-12-12 on well drained, and 3-18-9 on poorly drained muck if mint is late in blossoming.	Meadows	Seeding without nurse crop often advisable. Early seeding necessary to beat weed growth.
Carrots Parsnips	Fertilize in 7" drills 3 to 4 inches deep. Sow parsnips early for good yields on muck.	Soybeans	Sow around May 20 in vicinity of Lansing if weather is favorable. Use early variety if grain is desired.
Potatoes	Fertilize in 7" drills or, on moist muck, put 400 pounds in row, preferably 4" below seed. Plant close to avoid hollow heart and frost injury and fairly early for good yields.	Sugar beets	Apply fertilizer and salt in 7" drills, 4" deep, or apply not more than 200 pounds fertilizer in row, preferably 2" below seed. Apply remainder in 7" drills.
		Beans Cucumbers Squash Tomatoes	These crops easily killed by frost, therefore, generally not safe on muck soil. Keep soil compact and well supplied with moisture to help prevent frost injury.
		Blueberries	Blueberries require very strongly acid soil (pH 5.0 or lower).
		Strawberries	For berry production on strawberries, fertilize lightly —100 to 300 pounds 0-12-12. For plant production apply 500 to 600 pounds 0-9-27.

