

FERTILIZER RECOMMENDATIONS FOR 1943

Fertilizer Grades Authorized For Sale in Michigan¹

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

Victory garden fertilizer 3-8-7

Superphosphate—18% phosphoric acid or higher

Muriate of potash—50% potash or higher

Sulphate of potash—48% potash or higher

Nitrate of soda—16% nitrogen

Sulphate of ammonia—20% nitrogen or higher

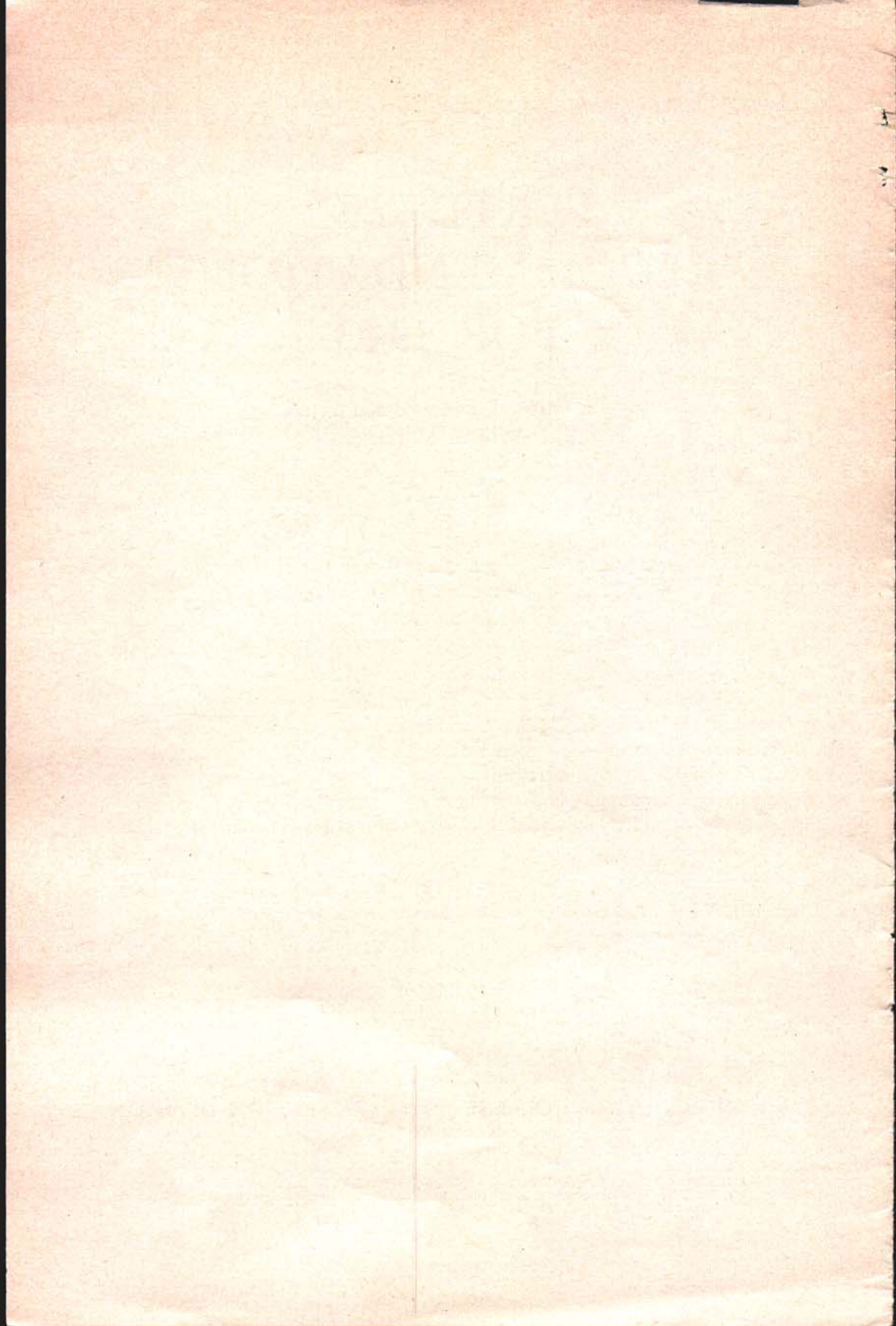
Some other materials carrying nitrogen, phosphoric acid, or potash may be sold.

¹Higher grades in the same ratios as 0-16-8; 0-12-24; 0-14-14; 0-12-36; 4-24-12 are approved for use, if they can be purchased at a lower cost per unit of plant food.

PREPARED BY
DEPARTMENTS OF SOIL SCIENCE
AND HORTICULTURE

MICHIGAN STATE COLLEGE : : EXTENSION DIVISION
EAST LANSING

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Regulations by the Food Production Administration Concerning Distribution and Use of Fertilizers

(Quotations are from FPO 5, January 18, 1943)

REQUESTS FOR PURCHASE OF FERTILIZER

Fertilizer, other than "Victory Garden Fertilizer" (3-8-7) or fertilizer containing no chemical nitrogen,¹ may not be delivered to a fertilizer user unless the purchaser shall have filed a written statement giving the following information—

"(i) The quantity of fertilizer used during the season July 1, 1940 to June 30, 1941 (or during the season July 1, 1941 to June 30, 1942, if information for the prior season is not available), by quantity, grade or material, crops and acreage of crops fertilized.

"(ii) That the applicant is or is not farming the same land in the 1942-1943 season as in the season for which information is given ---.

"(iii) The total fertilizer requirements for the season which began July 1, 1942 by crops, acreage of crops, grades of mixed fertilizer or materials and quantity required.

"(iv) The fertilizer, if any, which has been ordered from any other supplier but which has not been delivered.

"(v) The fertilizer which the applicant has used since July 1, 1942, to take care of the above requirements, and also the fertilizer which he has on hand.

"(vi) Signature and address of applicant, date of signing statement and the name of the dealer, agent or manufacturer to whom the statement is given."

Local fertilizer dealers have blanks for the submitting of the above information. Every fertilizer user should call on his local dealer *at once* and fill out one of these blanks.

RATES OF APPLICATION²

There are no regulations concerning the use or rate of application of those fertilizers which do not contain chemical nitrogen.

¹"Chemical nitrogen means any nitrogen, other than organic nitrogen, including, but not limited to, ammonium sulfate, sodium nitrate, calcium cyanamid, urea, and nitrogen-bearing solutions."

²"Rate of Application," means the pounds of fertilizer applied per acre.

MINERAL SOILS

Fertilizer Recommendations for 1943
Michigan State College Departments of Soils and Horticulture

Crop	Heavy Soils (loams, silt loams and clay loams)			Light Soils (light loams, sandy loams and loamy sands)		
	Grades Recommended	Rate per acre (lb.)	Suggestions	Grades Recommended	Rate per acre (lb.)	Suggestions
Oats, barley	Superphosphate 18 to 20% 0-14-7, 0-20-10	200 to 300	Some potash is needed if no manure is applied in the rotation. Seed a legume for hay or green manure.	0-12-12 0-14-7 0-20-20	200 to 300	Use 0-14-7 on the heavier soils of this group.
Sugar beets	2-16-8, 2-12-6	300 to 500	Place beside and below the seed. Not over 200 pounds with the seed is safe. Use 5-10 pounds borax per acre.	Sugar beets are not recommended on these soils unless the humus content is very high. On such soils, use a fertilizer higher in potash, such as 3-12-12.		
Chicory	2-16-8, 2-12-6	400	Place beside and below the seed. Not more than 200 pounds with the seed is safe. Use 5-10 pounds borax per acre.	Chicory is not recommended on these soils unless the humus content is very high. On such soils, use a fertilizer higher in potash, such as 3-12-12.		
Corn ¹	Superphosphate 18 to 20% 2-16-8, 2-12-6	125	On soils high in humus, fertilizer containing no nitrogen may be used.	2-16-8 2-12-6 0-14-7	200	On soils high in humus content fertilizer containing no nitrogen may be used.
Beans	0-14-7 0-20-10 2-16-8	200 to 300	Apply 1 inch to the side and 1½ inch below seed, but none with the seed.	Beans are not recommended on these soils. If grown, use 0-12-12 or 0-9-27 applied as on heavy soils.		
Alfalfa	Superphosphate 18 to 20% 0-14-7, 0-20-10	200 to 300	Fertilize when seeding and after second year.	0-12-12 0-20-20 0-8-24	200 to 300	Fertilize when seeding and after first cutting of second year.

Potatoes* Early	4-10-6	400 to 500	Apply in bands at the side of the seed. More potash may be needed in some cases.	4-10-6	500 to 600	Apply in bands at the side of the seed. If soil has been heavily manured, 2-16-8 may be used. More potash may be needed in some cases.
Late	2-12-6 2-16-8	400 to 600		3-12-12	500 to 700	
Wheat, rye	Superphosphate 18 to 20% 0-14-7	300	Some potash is needed if no manure is applied in the rotation. Seed a leugme for hay or green manure.	0-12-12 0-20-20 0-14-7	300	A winter top dressing of manure is advisable.
Tree fruits	(NH ₄) ₂ SO ₄ NaNO ₃ Cyanamid	3-5 lb. per tree	Use less for small or very vigorously growing trees.	(NH ₄) ₂ SO ₄ NaNO ₃ Cyanamid	3-5 lb. per tree	Use less on small or over vigorous trees. Cyanamid for fall application only.
Small fruits	(NH ₄) ₂ SO ₄ NaNO ₃	200 to 500		(NH ₄) ₂ SO ₄ NaNO ₃	200 to 500	
Strawberries	4-16-4	200 to 500		4-16-4	200 to 500	
Canning tomatoes	4-16-4, 2-16-8 Superphosphate 18 to 20%	400 to 800	On soils high in humus, use formula with least nitrogen.	4-10-6 4-16-4	500 to 1000	Recommendations are for early to matatoes for market.
Canning peas	0-14-7, 2-16-8	200 to 300	No nitrogen is needed unless the soil is low in humus content.	0-12-12 3-12-12 2-12-6	250 to 300	On soils low in humus, a fertilizer containing nitrogen is advisable.
Canning corn	2-16-8, 2-12-6	150 to 200	Apply in row with planter.	4-16-4 3-12-12	150 to 250	Apply in row with planter.

*In a few cases, especially under irrigation, up to 1000 pounds of fertilizer may be advisable.

†The chief advantage of fertilizing corn is to stimulate early growth thus permitting earlier cultivation and the control of weeds at less cost. If other crops in the rotation are well fertilized, no fertilizer need be used on the corn crop directly.

MINERAL SOILS—(Continued)
Fertilizer Recommendations for 1943
Michigan State College Departments of Soils and Horticulture

Crop	Heavy Soils (loams, silt loams and clay loams)			Light Soils (light loams, sandy loams and loamy sands)		
	Grades Recommended	Rate per acre (lb.)	Suggestions	Grades Recommended	Rate per acre (lb.)	Suggestions
Red beets	2-16-8, 2-12-6	300 to 500	Place beside and below seed or broadcast before planting. Use 40 pounds borax broadcast or 20 pounds drilled beside seed with fertilizer.	2-16-8 2-12-6	400	Place beside and below seed or broadcast before planting. Broadcast 40 pounds borax or drill 20 pounds beside seed with fertilizer.
Soybeans	0-14-7, 0-20-10 2-16-8	200	Apply 1 inch to the side and 1½ inch below seed, but none with the seed.	Soybeans not recommended on these soils.		
Cabbage, spinach, lettuce, and similar crops	2-16-8 4-16-4 0-20-20	400 to 800	Use grades containing nitrogen unless soil is high in humus.	4-10-6 3-12-12 NaNO ₃ (NH ₄) ₂ SO ₄	400 to 800	Side-dressing with nitrogen fertilizer during growth is desirable.
Peppers Eggplant	2-16-8, 4-10-6	250 to 500	On soils high in humus use grade lower in nitrogen.	4-10-6	300 to 600	Apply largely in the row.
Beets, carrots, and other roots	2-16-8, 2-12-6	500	Apply beside seed or broadcast before planting.	2-16-8 3-12-12	500	Apply beside seed or broadcast before planting.
Pickles ² , melons, squash, etc.	4-16-4, 4-10-6	250 to 500	For cucumbers on soils high in humus use 18 to 20% superphosphate.	4-16-4 4-10-6	400 600	For early market, mix 200 to 300 pounds with soil in hills and broadcast remainder before planting. Cucumbers for pickling, broadcast fertilizer before planting.

Snap beans	2-16-8	200 to 400	Apply 1 inch to the side and 1½ inch below seed, but none with the seed.	3-12-12	300 to 500	Apply 1 inch to the side and 1½ inch below seed, but none with the seed.
Market gardens	4-16-4, 4-10-6 2-16-8, 2-12-6	400 to 1000		4-10-6 3-12-12	500 to 1200	
Home gardens	3-8-7 Victory fertilizer	300 to 500	Farmers purchasing nitrogen-carrying fertilizer for other crops may use the same on their gardens.	3-8-7 Victory fertilizer	500	Farmers purchasing nitrogen-carrying fertilizer for other crops may use the same on their gardens.
Radish seed	2-16-8, 2-12-6	250 to 500	Do not apply over 200 pounds in the row.	2-16-8 2-12-6	250 to 500	Do not apply more than 200 pounds in the row.
	In nursery beds		Broadcast and work into soil before planting 500 pounds of 4-10-6. Topdress once or twice with 150-200 pounds of nitrogen fertilizer during growing season.			
Asparagus (for light soils only)	Newly planted beds first and second years. Established beds 3 years or more old. Extremely weedy plantings		Apply 800-1000 pounds of 2-8-16 early in spring. Topdress with 300-500 pounds of nitrogen fertilizer during July. Before cutting season, disk into the soil 800 to 1000 pounds of 2-8-16 and 125 pounds of nitrate of soda. After cutting season, apply 150 to 200 pounds muriate of potash and 200-300 pounds nitrogen fertilizer. Lime when soil test shows acid. Apply 600-800 pounds 0-20-0 and 400 pounds muriate of potash before cutting season. When first crop of weeds are 2 inches high, apply 350 pounds of cyanamid in band 18 inches wide over the row. If second crop of weeds appears, repeat cyanamid application. This treatment controls annual weeds but not quackgrass.			

²In cool, wet season pickles should be side-dressed with 100 to 200 pounds of nitrate of soda.

MUCK SOIL

Fertilizer analysis and rate of application* for crops on muck soil, together with initial percentage of minor element plant foods which should be included in the fertilizer mixture.

Salt (lb. per acre)	Acid Muck Soils (pH 6.5 or less)			Alkaline and Faintly Acid Muck (pH 6.7 or more)			Salt (lb. per acre)
	Fertilizer analysis for mucks of good and poor drainage. Percentage minor plant foods in fertilizer mix- ture.			Fertilizer analysis for mucks of good and poor drainage. Percentage minor plant foods in fertilizer mix- ture.			
	Per cent in fertilizer	Fertilizer analysis		Good drain- age	Poor drain- age	Per cent in fertilizer	
	Borax	Copper sul- phate	Good drain- age	Crop and Rate of Fertilization		Manga- nese sulphate	Borax
				Crop**	Pounds per acre		
0	0	0	0-9-27	Asparagus.....	400-800	15	0
0	0	0	0-12-12	Beans.....	250-500	15	0
0	0-5	2.5-5	3-9-18	Broccoli.....	400-600	15	5
100	0-5	5	3-9-18	Cabbage.....	500-1000	5-10	5
0	0	5	0-9-27	Carrots.....	400-800	15	0
0	2.5	2.5	3-9-18	Cauliflower.....	800-1600	5	2.5
500-1000	2.5	0	3-12-12 3-9-18	Celery { Early..... Late.....	1200-1800	10	5-10
0	0	2.5	3-9-18	Cucumbers.....	400-800	10	0
100-200	0	2.5	3-9-18	Kohl rabi and kale.....	500-600	0	0
0	5	10	3-9-18	Lettuce.....	500-800	15	5
0	0	5	3-12-12 0-12-12	Mint.....	300-450	0	0

FERTILIZER RECOMMENDATIONS FOR 1943

0	0	5	3-12-12	0-10-20, 0-12-12	Onions.....	800-1400	0-12-12, 0-20-20	3-12-12, 3-18-9	10-15	0	0
0	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	3-9-18	0-9-27	Potatoes.....	600-1000	0-9-27	3-9-18	15	0	0
0	0	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	3-9-18	0-9-27	Radishes.....	400-800	0-9-27	3-9-18	15	5	100-200
0	5	10	3-9-18	0-9-27	Spinach.....	500-800	0-10-20	3-9-18	10-15	5	0
0	5	0	3-12-12	0-10-20	Sweet corn.....	400-800	0-10-20	3-12-12	10	5	0
500-1000	2.5-5	5	3-9-18	0-9-27	Table beets, Swiss chard.....	600-1000	0-10-20	3-9-18	10-15	10	500
0	0	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	0-10-20	0-9-27	Turnips, rutabagas.....	300-500	0-9-27	0-10-20	10-15	5	500
0	5	0	3-9-18	0-9-27	Corn, field.....	250-400	0-9-27	3-9-18	15	5	0
0	0	5	.....	0-9-27	Grain.....	250-400	0-9-27	.....	15	0	0
500-1000	2.5	5	3-9-18	0-9-27	Sugar beets, mangels.....	300-600	0-9-27	3-9-18	0	5	500-1000
0	0	5	0-9-27	0-9-27	Permanent pasture.....	100-150	0-9-27	0-9-27	0	0	0
0	0	2.5	3-9-18	0-9-27	Timothy & alsike, brome grass	200-350	0-9-27	3-9-18	15	0	0
0	0	2.5	3-9-18	0-9-27	Reed canary grass.....	300-400	0-9-27	3-9-18	15	0	0
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.
 **Sidedressings 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.

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 lbs. 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 lbs. for field corn and 400 lbs. 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 increased 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 hay 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 lbs. 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 lbs. 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 sate 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.

GROUP A CROPS

Fertilizers containing chemical nitrogen may be applied to crops in Group A at rates up to, but not exceeding, the rates used previously by the applicant, or previously used on the farm where the fertilizer is to be applied, or at the rate customarily used in the neighborhood, or at the rate recommended by the Agricultural Experiment Station. In no case, however, is the rate of application to exceed that recommended by the Agricultural Experiment Station of Michigan State College.

GROUP B CROPS

Fertilizer containing chemical nitrogen may be applied to Group B crops at the rate per acre used by the purchaser, or used on the farm for which the fertilizer is being purchased, "in either the 1940-1941 or 1941-1942 season". If such information is not available, then the rate of application used on comparable farms in the same area growing the same crop may be used. In no case shall the rate of application exceed that recommended by the Agricultural Experiment Station of Michigan State College.

No fertilizer containing chemical nitrogen shall be used "on any Group B crop during the 1942-1943 season, unless chemical fertilizer containing chemical nitrogen was used, in the 1940-1941 or 1941-1942 seasons, on any Group B crop by such person or on any Group B crop on the farm for which such fertilizer is being requested".

RESTRICTIONS CONCERNING DISTRIBUTION AND USE OF CHEMICAL NITROGEN

"In making deliveries of chemical fertilizer containing chemical nitrogen, fertilizer manufacturers, dealers, and agents shall fill orders for such fertilizer for use on Group A crops before filling orders for such fertilizers for use on Group B crops requiring such fertilizer at the same time or at a later time." Prior to April 1, 1943, there shall not be delivered to any person for use on field corn "mixed chemical fertilizer containing chemical nitrogen in excess of 50 per cent of such person's requirement - - -"

Fertilizer containing chemical nitrogen shall not be used "on lawns, golf courses, parks, cemeteries, roadsides, or *commercial* plantings of trees, shrubs, or flowers," or "on melon or cucumber crops, except where grown specifically for seed purposes, or in the case of cucumbers where grown for processing - - -" Mixed fertilizer containing chemical nitrogen shall not be used "on spring-sown small grains to be harvested for grains - - -".

No fertilizer containing chemical nitrogen shall be used, "on victory gardens other than the grade of 3-8-7. Such 3-8-7 grade shall be labeled 'Victory Garden Fertilizer—For Food Production Only.'" However, "nothing in this paragraph shall prohibit any person who purchases chemical fertilizer pursuant to this order for use other than on his victory garden from obtaining and using on his victory garden chemical fertilizer of the grade or grades so purchased".

CROP GROUPS

GROUP A CROPS

I. Field crops

- (a) Castor beans
- (b) Cotton (varieties with staple $1\frac{1}{8}$ " or longer)
- (c) Flax (fiber and seed)
- (d) Guayule
- (e) Hemp (fiber and seed)
- (f) Hybrid corn for production of seed only
- (g) Peanuts
- (h) Soybeans

II. Vegetable crops

- (a) Beans, dried
 - (b) Beans, snap
 - (c) Beans, lima
 - (d) Beets
 - (e) Cabbage
 - (f) Carrots
 - (g) Kale
 - (h) Onions
 - (i) Peas, dried edible
 - (j) Peas
 - (k) Peppers
 - (l) Potatoes, Irish
 - (m) Potatoes, sweet
 - (n) Spinach
 - (o) Sweet corn
 - (p) Tomatoes
 - (q) Vegetable seeds
- } For all purposes

III. Other crops

- (a) Tung
- (b) Dried fruits
 1. Prunes for drying
 2. Figs for drying
 3. Raisins for drying
 4. Apricots for drying
 5. Peaches for drying

GROUP B CROPS

Group B includes those crops not listed in Group A or for which the use of chemical nitrogen is not especially restricted, see page 11.