

Declassified E.O. 12356 Section 3.3/NND No. 785015

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AGRICULTURE
OCT. 1943

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Comments.

TO: Distribution "A" and One to Each Region including I. 24356

FROM: Agric. A. C.

SUBJECT: Surplus food production in North Africa; estimated fertilizer, seed and other production input requirements for Sardinia, Sicily, Calabria, Lucania, Apulia and Campania. *

REFERENCE: AC/1075.

DATE: 11 October 1943.

Information regarding surplus production and production input requirements contained herein represent suggestions based on best available data and should prove of value to all regions including 1, 2, and 3 and also to S4, AMG, Algiers. Estimates are considered to be ultra conservative in the light of attaining the following or similar objectives:

1. To salvage the maximum amount of food crops recently harvested or which will be harvested within the next several months.
2. To plant the maximum acreage of cereals and vegetables this fall and winter.
3. To reduce to the minimum tonnages of food-stuffs which might otherwise have to be shipped into areas occupied by Allied Forces.

I. SURPLUS FOOD IN NORTH AFRICA.

Surplus foodstuffs in North Africa from this years harvest and anticipated surpluses in 1944 based on provision of necessary production input requirements already requisitioned and/or on hand are tabulated in Table I. The tonnages listed as surplus are, or will be, in excess of the needs of civilians and of the French Army.

Assuming surpluses have been accurately estimated, it is vital that they be requisitioned long enough in advance to assure delivery of desired quantities at specific times and places. Information indicates that neither French nor NAEB authorities have succeeded to date in establishing a co-ordinated production, harvest and marketing program.

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- Based largely on conferences between Acting Director Agric. A.C. and NAEF officials particularly Messrs. Wilmer Sundelson, Norman Stanley, E.H. Wingate and Lou Blatchley. Statistics contained herein with minor exceptions were prepared on request by NAEF.

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TABLE 1.

SURPLUS FOOD COMMODITIES - NORTH AFRICA.

COMMODITY	AVAILABLE 1943 (In Metric Tons)	FROM 1944 HARVEST (In Metric Tons)	SOURCE OF SUPPLY. (In Metric Tons).
Wheat	30,000	125,000	40,000 Morocco 25,000 Tunis 50,000 Algeria
Barley	--	50,000	Morocco
Dried Legumes	30,000 - 40,000	70,000	60,000 Morocco 10,000 Algeria
Potatoes	--	100,000	Morocco Algeria
Vegetables	--	75,000	40,000 Morocco 35,000 Algeria
Citrus Fruits	--	80,000	Morocco Algeria Tunisia
Seeds, Dried Legumes	5,000	7,000	Morocco
Seeds, Vegetable	--	--	Morocco
Table Beets	--	--	--
Carrots	--	--	--
Cauliflower	--	--	--
Lettuce	--	--	--
Radish	--	--	--
Tomatoes	--	--	--
Spinach	--	--	--
Salsify	--	--	--

TOTAL

(1) Dried legumes include peas, chick peas, broad beans and lentils. Separate tonnages are not listed because a great expansion in production can be initiated this coming year and because of price considerations, and weather conditions farmers may change or expand their acreage from for example, broad beans to chick peas.

(2)

(2)					
Potatoes	--	100,000		Morocco	
				Algeria	
(3)					
Vegetables	--	75,000	40,000	Morocco	
			35,000	Algeria	
(4)					
Citrus Fruits	--	80,000		Morocco	
				Algeria	
				Tunisia	
(5)					
Seeds, Dried Legumes	5,000	7,000		Morocco	
Seeds, Vegetable	--			Morocco	
Table Beets					
Carrots					
Cauliflower					
Lettuce					
Radish					
Tomatoes					
Spinach					
Salsify					

TOTAL

- (1) Dried legumes include peas, chick peas, broad beans and lentils. Separate tonnages are not listed because a great expansion in supplies can be initiated this coming year and because of prices considered high, and weather conditions farmers may change or expand their acreage from for example, broad beans to chick peas.
- (2) Potatoes - It is understood that this 100,000 tons would be under government control with first priority of 50,000 tons for the United Armies and the balance to be stockpiled, or it could be diverted in part for domestic use.
- (3) Vegetables - It is realized fresh vegetables are a perishable commodity and that this is requiring a large tonnage. However, the United Forces should consume large quantities, (3) many of the army vegetables such as carrots, onions, turnips, tomatoes (pickled, green, beets, etc. have keeping qualities of 4 weeks or more, (4) the processing, freezing, and dehydration programs being initiated and expanded will use large quantities.
- (4) Citrus fruits - The quantity suggested as surplus is based on 1953-54 average net exports. The figures are obtained from reports of Mr. Thibodeaux's "Net Supplies of Major Food Commodities-North Africa".
- (5) Dried legume seeds - It should be noted that dried legume seeds and cereal seeds as well, are the same as the edible product and are simply selected strains of higher germination.

II ESSENTIAL AGRICULTURAL INPUT REQUIREMENTS.

I. Summary.

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Agricultural and forestry production and distribution of essential food-stuffs in Italy and other Mediterranean areas are not normally capable of being maintained without the importation of essential supplies. Those areas are notoriously deficient in metals and metal working facilities and are equally incapable of producing the major part of the other requirements.

This statement of essential requirements indicates some of the items which need to be shipped in. The program is designed to measure the initial and urgent requirements of Sardinia, Sicily and Southern Italy comprising the provinces of Calabria, Lucania, Apulia, and Campania.

A few of the most important input requirements to obtain maximum food are discussed and/or itemized. Furthermore, in the case of fertilizers and seeds an attempt has been made to rely on requirements which can be provided from local or nearby sources in order that the totality of overseas requirements may be reduced.

No attempt has been made to point out supply sources which may be available when the liberation extends substantially beyond the areas for which this proposed program applies.

The production, storage, processing, packing and distribution of foodstuffs cannot be maintained if only these input requirements designed exclusively for direct agricultural use are considered. Transportation is essential at all stages of food supply and it is certain that no production program will achieve its purpose without the provision of adequate transportation. Furthermore the new supply of hand tools herein suggested represents only a fraction of the amount which must be utilized by agricultural workers. For the remainder of the tools and for implements, vehicles, machines and food processing apparatus and food storage facilities which must be available and maintained, it is assumed that repair facilities exist. In North Africa it has not been possible to maintain the needed metal or woodworking repair facilities without the provision of essentials parts.

In addition to these general civilian facilities for transportation and for maintenance work, it is essential to provide for the following types of supplies which are not itemized in this memorandum because an intelligent estimate of requirements is impossible in the absence of more detailed knowledge of actual needs.

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In addition to these general civilian facilities for transportation and for maintenance work, it is essential to provide for the following types of supplies which are not itemized in this memorandum because an intelligent estimate of requirements is impossible in the absence of more detailed knowledge of actual needs.

- Agricultural machinery and parts.
- Animal feed-stuffs and veterinary supplies.
- Animal drawn implements, vehicles and parts.
- Fuel and lubricants.
- Machinery and parts for food processing apparatus.
- Motors, engines and parts.

The general character of the economy of Sardinia, Sicily and Southern Italy suggests that the machinery and parts for the maintenance of food processing industries are of the greatest importance. The operation of food processing facilities such as flour mills, olive oil presses, wineries and food preservation, freezing and storage plants will be interrupted unless parts and supplies specifically designed for their use are provided. Perforated sheets, metal cloth, transmission steel bars and steel grinding rolls are among the metal requirements of flour mills. In addition cloth and leather made into special parts are needed in the same plants.

Wineries require copper tubing and sheets while olive oil presses require high pressure tubing. In other words, availability of essential quantities of basic foodstuffs to residents in urban areas is not assured by the mere production of foodstuffs on farms.

2. Chemical Fertilizers.

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Although the use of chemical fertilizers has not been as prevalent in the districts under consideration as in the more highly developed agricultural regions of Northern Italy, such as the Po Valley and the Lombardy Plain, nevertheless the use of such fertilizers is essential to obtain pre-war production of cereals, grains and vegetables. As a result of fertilizer rationing, farmers have received amounts far below their pre-war consumption. Phosphate supplies from North Africa have been cut off for some time, and now the usual heavy imports of nitrogenous fertilizers from Germany are no longer available.

(a) Phosphates were in particularly heavy demand in Sicily and Apulia, while nitrogen fertilizers were widely employed in the Campania.

Some indication of the probable increase in yield per hectare with the application of given amounts of ammonium nitrate is indicated below:

Crop	Usual Amount of Ammonium Nitrate Applied per Hectare (in quintals)	Yield Increase per Hectare by application
Winter potatoes	2.5	about 35%
Summer potatoes	1.5	" 20%
Carrots & Turnips	2.0	" 40%
Cereals (soft & hard)	1.0	12% to 20%

The annual minimum nitrogenous fertilizer requirements compared with 1938 consumption for each of the areas in question are indicated on Table 2.

Ammonia sulphate or ammonia nitrate will be used mostly for potatoes and other vegetables and also for citrus fruits. Most of the soil in which potatoes are grown is light friable soil dependent very largely upon fertilizer to produce a crop. In Campania alone more than 155,000 acres of potatoes were grown in 1938 - 1940 in addition to heavy vegetable crops.

In the past Italy has manufactured much of its own super-phosphates obtaining phosphate rock from North Africa, sodium nitrate from U.S.A. and possibly other sources and sulphur from Sicily. If the super-phosphate

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Summer potatoes	1.5	" 20%
Carrots & Turnips	2.0	" 4%
Cereals (soft & hard)	1.0	12% to 20%

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In the past Italy has manufactured much of its own super-phosphates obtaining phosphate rock from North Africa, sodium nitrate from U.S.A. and possibly other sources and sulphur from Sicily. If the super-phosphate factories in Sicily and Southern Italy are operating or can be put in operation and if sodium nitrates can be made available much economy in shipping will result. In general the use of super-phosphates will increase agricultural production from 25% to 35%. Estimated annual needs of the tonnage and source of each major ingredient are itemised in Table 3.

Our limited information indicates that super-phosphate plants are located at or near Palermo, Catania, Compefrance, Licata and Milazzo; also in Calabria and Catrone. Italian Government Provincial Inspectors might be in a position to advise our CAC's of the condition of plants, capacity, materials and supplies needed to put plants in operations, etc.

Table 2.

ANNUAL MINIMUM REQUIREMENTS
NITROGENOUS FERTILIZERS

(1938 Consumption in Brackets)

	IN METRIC TONS			Sodium Nitrate (See Supplement Table 3)
	Ammonium Sulphate	Ammonium Nitrate	Calcium Nitrate	
SICILY	9,900 (20,664)	2,000 (3,370)		3,500 (4,862)
SARDINIA	175 (1,177)	None		None
CALABRIA	375 (2,330)	None		None
LUCANIA	130 (617)	None		None
APULIA	5,750 (13,695)	550 (1,597)		1,100 (1,802)
CAMPANIA	21,700 (30,145)	450 (833)		1,400 (2,450)
TOTAL	38,000	3,000	4,950	6,000
1938 Con- sumption)	(78,828)	(5,800)	(16,357)	(9,114)

SARDINIA	175 (1,177)	None	None
CALABRIA	375 (2,330)	None	None
LUCANIA	130 (617)	None	None
APULIA	5,750 (13,695)	550 (1,597)	1,100 (1,802)
CAMPANIA	21,700 (30,145)	450 (833)	1,400 (2,450)
TOTAL	58,000	3,000	4,950
1938 Con- sumption)	(78,828)	(5,800)	(9,114)

Table 3

Estimated Annual Requirements,

SUPER-PHOSPHATES.

(1938 Consumption in Brackets.)

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<u>SICILY:</u>	130,000 M.T. (132,280)	
	72,000 of Phosphate Rock from Tunisia	
	24,170 of Sulphur from Sicily.	
	578 of Sodium Nitrate from U.S.A. or elsewhere.	
<u>SARDINIA:</u>	20,000 M.T. (28,720)	
	11,100 of Phosphate from Tunisia.	
	8,700 of Sulphur from Sicily.	
	89 of Sodium Nitrate from U.S.A. or elsewhere.	
<u>CALABRIA:</u>	20,000 M.T. (28,424)	
	11,000 idem as above	
	3,700 " "	
	89 " "	
<u>LUCANIA:</u>	12,000 M.T. (20,690)	
	6,666 idem as above.	
	2,222 " "	
	53 " "	
<u>APULIA:</u>	62,000 M.T. (66,062)	
	34,440 idem as above	
	11,480 " "	
	375 " "	
<u>CAMPANIA:</u>	45,000 M.T. (52,242)	
	25,000 idem as above.	
	8,333 " "	
	200 " "	

Recapitulation : Total: 289,000 M.T. Super-phosphate.

11,100 of phosphate from Tunisia.
 3,700 of Sulphur from Sicily.
 89 of Sodium Nitrate from U.S.A. or elsewhere.

CALABRIA: 20,000 M.T. (28,424)

11,000 idem as above
 3,700 " " "
 89 " " "

LUCANIA: 12,000 M.T. (20,690)

6,666 idem as above.
 2,222 " " "
 53 " " "

APULIA: 62,000 M.T. (66,062)

34,440 idem as above
 71,480 " " "
 375 " " "

CAMPANIA: 45,000 M.T. (52,242)

25,000 idem as above.
 8,333 " " "
 200 " " "

Recapitulation : Total: 289,000 M.T. Super-phosphate.

of which

160,206 M.T. Phosphate Rock from Tunisia
 53,605 M.T. Sulphur from Sicily.
 1,384 M.T. Sodium Nitrate from U.S.A. or elsewhere.

or equivalent Nitric Acid.

(b) Phosphate Situation at Various Points in North Africa.

(i) Sfax, immediately available stocks are 31,000 tons 66-68%; 49,000 tons 58-63%; remainder unavailable owing to war damage.

(ii) Immediate loading rate is 200 tons per hour into steamers not exceeding 17 foot draught.

(iii) Ministry of War Transport states that availability of steamers of required draught is very remote except for those which may be returning from the Middle East. Neutral coasters are barred for operational reasons. 4160

(iv) Speed of loading could be brought to 700 tons per hour, and draught of vessels to 21 feet by repairs to quayside and removal of obstructing wreckage; the channel requires three to six weeks' work. Heavy lifting apparatus and perhaps a trained crew of workers will also be necessary for installation work.

(v) Stocks at mine are 144,000 tons of 66-68%, 393,000 tons of 63-66% and 273,000 tons of 58-63%.

(vi) Actual rail transport is bottlenecked by requisition of fifteen existing locomotives by British Forces. When locomotives are released, haulage capacity of rolling stock will be 15,000 tons a month. If Tunisian state railways return 1,000 cars lost them by the mine company, haulage will be brought to 50,000 tons per month. If locomotives now requiring repairs or reconditioning could be made available, haulage capacity could be brought up to 100,000 tons per month.

(vii) Phosphate loading in Sousse and Tunis is technically out of the question for some time to come.

(viii) Stock at Bone - 15,000 tons of 66%. No technical difficulty in loading. Stock at mine 25,000 tons but no rail transport facilities are available.

3. Schedule for Arrival of Seeds and Fertilizers.

Fertilizer and seed requirements tabulated in table 2, 3, and 4, must be available to farmers in Italy on or before planting dates. For this reason dates of arrival at docks should be at least 30 days prior to the date planting begins for a particular crop. Planting dates not only vary for different crops but also have a wide range within each crop.

- (v) Stocks at mine are 144,000 tons of 66-68%, 398,000 tons of 63-66% and 273,000 tons of 58-63%.
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- (vii) Phosphate loading in Sousse and Tunis is technically out of the question for some time to come.
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Fertilizer and seed requirements tabulated in table 2, 3, and 4, must be available to farmers in Italy on or before planting dates. For this reason dates of arrival at docks should be at least 30 days prior to the date planting begins for a particular crop. Planting dates not only vary for different crops but also have a wider spread in some Provinces than in others.

Crop	Date shipment should arrive	Date Planting begins	Date planting ends in certain Provinces
Wheat	Aug. 20	Sept. 20	Dec. 30
Barley	Aug. 1	Sept. 1	Dec. 31
Rye	Aug. 10	Sept. 10	Nov. 30
Oats	Aug. 30	Sept. 30	Dec. 31
Rice	Aug. 10	Sept. 10	Nov. 30
Corn (Maize)	Feb. 15	Mar. 15	May. 31
Rice	Mar. 1	Apr. 1	Apr. 30
Beans - Horse	Aug. 30	Sept. 30	Dec. 20
Beans - Kidney	Jan. 1	Feb. 1	Jun. 15

The areas for which the above dates are applicable are: Sardinia, Sicily, Calabria, Lucania, Campania and Puglia. Seeds for the 1944 harvest must therefore be moved immediately to take advantage of the latest planting dates if the beginning planting dates are already past. Latest planting dates will be suitable only under the most favourable climatic conditions. (Section 7 Agriculture, C.A. Handbook for Italy contains planting dates by Provinces) 4159

As a general rule fertilizer is distributed at the time a crop is planted and therefore should be shipped immediately. If the crop has already been planted fertilizer can be used as a top dressing for cereals over a period of two or three months after the crop has been planted.

4. Vegetable Seed Requirements.

Lack of adequate and reliable information as to normal importations of seeds into the areas under consideration, present stocks on hand, conditions of land, agricultural supplies and machinery make it impossible to make more than rough estimates of seed requirements for all areas as a whole.

The estimated quantities of seed listed in Table 4 would serve mainly as a stimulus to production, supplementing domestic supplies, and building up virility, purity and productivity of seed stocks.

Consideration has also been given to the sources of seed supplies in the allied countries.

The following data gleaned from production and acreage figures quoted in the Annuario Statistico Italiano, are the basis of total acreage and production figures used.

(a) Potatoes.

In 1938, 270,000 acres were planted in these territories. Approximately 225,000 tons of seed would be needed to plant this area. Only 20,000 tons have been recommended to supplement domestic supplies. Even this small shipment will be subject to spoilage unless internal transportation facilities and organization exist to insure that the seed supplies are efficiently distributed to potato producers.

(b) Peas.

Normal pre-war acreage of this crop was approximately 45,000 acres. Seed supplies are available in North Africa and they are not perishable. Therefore, if there are not sufficient domestic supplies on hand this tonnage could be increased greatly and possibly make up to some extent a reduced potato acreage.

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(b) Peas.

Normal pre-war acreage of this crop was approximately 45,000 acres. Seed supplies are available in North Africa and they are not perishable. Therefore, if there are not sufficient domestic supplies on hand this tonnage could be increased greatly and possibly make up to some extent a reduced potato acreage.

Lentils, chick peas, and broad bean supplies are available in North Africa and, with the exception of lentils, supplies are fairly large.

(c) Beans.

There are no reliable data as to kinds and acreages grown in Italy therefore the recommended shipment should include many types unless more adequate information becomes available so that requirements can be more clearly indicated.

In commodities which produce seed annually i.e. melons, cucumbers, tomatoes, citrus fruits, etc. no particular shortage is anticipated.

Table No. 4

Vegetable Seed Requirements

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Kind.	Varieties.	Quantities (Metric tons)	It will plant estimated acreage, (acres)	Approximate Delivery Date	Suggested Source of Supply.
Potatoes.	Royal Kidney	5,000		Oct. 1-Nov. 15	
	Early Rose	5,000	25-28,000	Dec.	U.K.
	Red Sausage	10,000		Jan-Feb	
	Up to date				
Peas	Suitable				
	Both Smooth Two wrinkled varieties available for Med. area.	400	10,000	Immediate	N. Africa
Lentils	North Africa variety.	60	3,000	"	"
Chick peas	"	300	7,500	"	"
Broad Beans	"	1,000	40,000	"	"
Beans- Green.	Whole Bean Wax Green Podded Kentucky Wonder King of Wax etc.	50	1,100	"	U.S.
	Bush Beans Wax & Yellow Podded	5	110	"	U.S.
Beans- Dry	Varieties adaptable to Mediterr- anean.	400	9,000	"	U.S. & Canada.

Peas	Suitable Both Smooth Two wrinkled varieties available, for Med. area.	400	10,000	Immediate	N. Africa
Lentils	North Africa variety.	60	3,000	"	"
Chick peas	"	300	7,500	"	"
Broad Beans	"	1,000	40,000	"	"
Beans- Green.	Whole Bean Wax Green Podded Kentucky Wonder King of Wax etc.)	50	1,100	"	U.S.
	Bush Beans Wax & Yellow Podded	5	110	"	U.S.
Beans- Dry	Varieties adaptable to Mediterr- anean.	400	9,000	"	U.S. & Canada.
Cabbage	Charleston Wakefield Early Jersey Wakefield	10	18,000	"	U.S. or U.K.
Cauliflower	Early Snowball Danish Giant (for later delivery)	2	4,500	"	U.S.

Continued on next page.

Table 4 (Continued.)

Vegetable Seed Requirements.

Kind.	Varieties.	Quantities (Metric Tons)	It will plant estimated acres (acres)	Approx. Delivery Date.	Suggested Source Supply.
Onions and Garlic.	Flat white Italian. Red Bermuda. Red Majestic. Yellow Wertus. Adaptable varieties.	20	2,200		
	Adaptable varieties.	3 - 5	250-400	Immediate	N. Africa & U.S.
Melons & Water Melons.	Adaptable varieties.	3	1,500	"	U.S.
Tomatoes.	Marglobe & other adapt- able varieties. Boscade	2	3,500	"	"
Carrots	Early Charteroy. Other adapt. var.	10	4,000	Nov. on.	N. Africa & U.S.
Brussel Sprouts.	English varieties.	0.2	500	Immediate	U.K.
Turnips.	Purple top White egg Amber globe Crosby Egyptian Etc.	10	4,000	Oct. on.	U.S.
Beets	White tip Sparkler Scarlet Globe.	5	1,200	Dec. on.	"
Radish		5	2,000	Immediate	"
Spinach	Adaptable varieties.	6	1,000	"	N. Africa & U.S.
Lettuce.	Curly Leaf varieties. suitable for Countries.	2	3,000	Dec.	"

varieties.	3 - 5	250-400		
Melons & Water Melons.	3	1,500	"	U.S.
Tomatoes.	2	3,500	"	"
Carrots	10	4,000	Nov. on.	N. Africa & U.S.
Brussel Sprouts.	0.2	500	Immediate	U.K.
Turnips.	10	4,500	Oct. on.	U.S.
Beets	5	1,200	Dec. on.	"
Radish	5	2,000	Immediate	"
Spinach	8	1,000	"	N. Africa & U.S.
Lettuce.	3	3,000	Dec.	"
Cucumbers	5	5,000	Immediate	U.S.
Leeks				
Celery				
Others				
Broccoli				
Swiss chard				

5. Agricultural Hand Tools and Harness Supplies.

Labor will undoubtedly be the cheapest factor of production in the area under consideration. Land suitable for growing crops will be a scarce factor along with farm machinery. An available supply of hand tools will provide some assurance that all available land will be planted. The following list includes only those most essential hand tools in quantities which merely represent a safety factor rather than even conservative estimates of need based on number of farms and acreage of suitable land. Furthermore the specific tool specifications indicated represent an estimate of the tools in more or less general use in Southern Italy. One type of shovel, pitch fork and rake which is expected to serve several farming purposes represent examples of standardization.

Oxen, burro, mule and horse power needed for plowing, cultivating and harvesting will not be fully utilized unless harness supplies are available. The list shown in Table 5 on the following page includes estimated minimum requirements not to meet a conservative estimate of total needs but rather to provide a minimum quantity of the type of materials which are needed and most likely available in U.S. and in U.K.

6. Fuel and Lubricant Input Requirements.

No information is available as to the number of motor-driven transport vehicles (motor cars, trucks, lorries) used for agricultural purposes only. However, there were 19,237 agricultural tractors listed with the Italian public automobile registry on 31. Dec. 1938. Since there are no available figures as to the rate of fuel and lubricant consumption the following British figures are used as a basis for estimates:

- (a) Hours of work per tractor, per annum ----- 700 hours.
- (b) Fuel consumption (tractor vaporizing oil), per hr ----- 2 gal.
- (c) Gasoline (petrol) for starting, per month, ----- 12 gal.
- (d) Lubricating oil, per annum, ----- 30 gal.

As a further basis of estimates the following assumptions are made:

- (a) Number of tractors in occupied areas ----- 5,000.
- (b) Working hours, fuel and lubricant requirements same as for Britain.
- (c) Fueled with 80 octane, fuel oil, Diesel 702, and kerosene (Ref. C.R. 185, Section XVII, Table III).
- (d) Lubricants of the Hypoid 90 and engine oil types.

On the basis of the above assumptions 5,000 tractors would have the following per annum input requirements:

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- (c) Fueled with 80 cotton, fuel oil, Diesel 702, and kerosene (Ref. C.R. 185, Section XVII, Table III).
- (d) Lubricants of the Hypoid 90 and engine oil types.

On the basis of the above assumptions 5,000 tractors would have the following per annum input requirements:

Fuel	7,000,000 gallons (imperial)
Gasoline (petrol)	720,000 "
Lubricant	150,000 "
Grease	40,000 pounds.

Where it is necessary to subdivide requirements into any period of 180 days it must be borne in mind that generally speaking, the preplanting and planting season is from Sept. 15 to March 15. Harvest time is from March 1 to August 31. Miscellaneous demands are distributed throughout the year.

Table 5

Agricultural Hand Tools and Harness Requirements
(Specifications listed are from Lend-Lense catalogue.)

Item and Specification.	Quantity.	Tonnage, weight out handles.
<u>MATTOCKS.</u> - High socket, round eye, short cutter (Bernabe p. 276 fig. 2022)	24,000	60
5 1/2 lb size.		
<u>HOES.</u> - Socket at top - (Bernabe p. 269 fig. 1923)		
8 3/4" long 7" top width 6" bottom width	100,000	205
<u>SCYTHES.</u> - (Bernabe p. 272 fig. 1967)		
Blade 30" long.	18,000	20
<u>SPADING FORKS</u> - 4 triangular tines. (Bernabe p. 269 fig. 1931)		
Tines 12" long.	11,000	10
<u>SICKLES.</u> - Small teeth or plain (Bernabe p. 273 fig. 1981)	150,000	34
Blades 20" long.		
<u>SHEEP CLIPPERS</u> - (Bernabe p. 316 fig. 2296)		
Standard	4,000	2
<u>PICK AXES</u> - round hole, high collar. (Bernabe p. 40 fig. 88)		
23" long 7 1/2 lbs.	50,000	190
<u>SWAN NECK SHOVELS</u> - (Bernabe p. 39 fig. 81)		

$8\frac{1}{2}$ " long 7" top width 6" bottom width	100,000	205
<u>SCYTHES.</u> -		
(Bernabe p. 272 fig. 1967)		
Blade 30" long.	18,000	20
<u>SPADING FORKS</u> - 4 triangular tines.		
(Bernabe p. 269 fig. 1931)		
Tines 12" long.	11,000	10
<u>SICKLES.</u> - Small teeth or plain		
(Bernabe p. 273 fig. 1981)	150,000	34
Blades 20" long.		
<u>SHEEP CLIPPERS</u> -		
(Bernabe p. 316 fig. 2296)		
Standard	4,000	2
<u>TICK AXES</u> - round hole, high collar.		
(Bernabe p. 40 fig. 88)		
23" long 7 $\frac{3}{4}$ lbs.	50,000	190
<u>SWAN NECK SHOVELS</u> -		
(Bernabe p. 39 fig. 81)		
12 $\frac{1}{2}$ " long X 12 $\frac{1}{2}$ " wide - 3 lbs.	120,000	180
<u>STRAIGHT LINE CHAINS</u> (for harness & hauling)		
<u>ELECTRIC WELDED.</u>	(in feet)	
Polished not galvanised		
Bernabe p. 53 fig. 214		
11 EWG link wire chain	250,000	
3 " " " "	140,000	
000 " " " "	35,000	

Table 5 (Cont'd)

Agricultural Hand Tool and Harness Requirements		
<u>CUTTING SPADE - Open socket</u> (Bernabe p. 269 fig. 1934)	<u>Quantity</u>	<u>Tonnage with- out handles</u>
11 $\frac{1}{4}$ long x 8" top width x 7" bottom width.	5,000	7
<u>SPADING FORK - Round hole</u> (Bernabe p. 269 fig. 1922)		
3 teeth 13 $\frac{1}{4}$ " long	35,000	56
<u>PITCH & MANURE FORKS - four tines</u> (Bernabe p. 271 fig. 1951)		
Tine 12 $\frac{1}{2}$ " long	40,000	35
<u>RAKES - Straight head, curved teeth -</u> (Bernabe p. 271 fig. 1960 & 1963)		
14 teeth	15,000	9
<u>GRUB HOE - with two prongs</u> (Bernabe p. 270 fig. 1940)		
13 $\frac{3}{4}$ " long	15,000	8.
<u>HARNESSE SETS</u>		
Webbing - average weight - 40 lbs. Preponderantly for medium & small animals 10% suitable for oxen	20,000	400
<u>HORSE COLLAR LINING</u>		
Quality : Army duck. Width : 46" in the gray Construction : 48 x 36 Weight per yd. 13.20 ounces. To be delivered in the gray		3
<u>REINS TAPE</u>		
Heather substitute - Width : 1" To be delivered in the gray (Specifications furnished by Hope Webbing Co.)		1

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7850/5

RAKES - Straight head, curved teeth -
(Eernabe p. 271 fig. 1960 & 1963)

14 teeth	15,000	9
----------	--------	---

GRUB HOE - with two prongs
(Bernabe p. 270 fig. 1940)

13½" long	15,000	8.
-----------	--------	----

HAIRNESS SETS

Webbing - average weight - 40 lbs.
Preponderantly for medium & small animals
10% suitable for oxen

HORSE COLLAR LINING

Quality : Army duck. Width : 46" in the gray
 .Construction : 48 x 36
 Weight per yd. 13.20 ounces. To be delivered in the gray 3

REINS TAPE

Heather substitute - Width : 1"
To be delivered in the gray
(Specifications furnished by Hope Webbing Co.
Providence R.I.)

NEEDLES (To be ordered from U.K.)

For horse collar repair curved needle
Length : 8" 10,000 1

It is assumed that wooden handles will be provided from local wood or in any event that handles should be imported only as lumber to be processed locally to economize on shipping space.

7. Forestry Tools.

The limited tonnage which has been allocated to forestry tools represents an effort to provide a representative number of tree felling, milling and pruning implements. Requirements are shown in Table 6.

The steel wedges, axes and two-man saws are programmed in quantities which are likely to be needed for forestry work alone although the implements are also of great importance for general farm work.

The saw frames with blades, band saw rolls and hand saws are related to the volume of lumber which is expected to be prepared for use. This volume is smaller than that previously obtained from the area. For the selection of band saw sizes, those most commonly used in small scale saw mills and woodworking establishments in North Africa were chosen. It is believed that the widths and thicknesses specified will all be utilized.

Other sizes may be required and can be dealt with later.

The pruning saws and shears have been included because of the large number of olive and citrus fruit trees in the area.

8. Textile Supplies.

(a) The bulk of the tonnage provided for this category is allocated to binder twine. The estimated wheat production (roughly 2,000,000 metric tons) will certainly require a greater volume of twine on the assumption that at least 25% will be mechanically harvested and that 5 kilograms are needed per hectare. There is also no possibility of any substantial carry-over of the binder material previously used. The carry-over is normally not greater than 10%. It is doubtful also whether the heap, which is derived chiefly from Northern Italy, can be used. In further justification of this requirement it should be noted that Italy as a whole, and the areas under survey in particular, were large binder twine importers.

(b) The remainder of the tonnage has been allocated to textile items used as containers, protective coverings and draft animal harnessing. Special items include belting and repair materials.

(i) As containers jute bags have been provided for fertilizers on the assumption that each bag will be used several times. Furthermore, the limited number programmed is based on the availability of jute or substitute sacks in the area. The paper containers in the programme are expected to be used for some portion of the fertilizer container requirements. The tonnages of fertilizers and other agricultural chemicals which are recommended for importation should not be brought unless adequate provision is made for distribution to the many scattered small scale consumers.

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(ii) The wheat crop translated into flour represents a further distribution problem. Cotton sacks are provided for this purpose. The number of sacks programmed is far lower than the number needed, the volume having been reduced because of the beliefs that some sacks are available, that most sacks can be re-used, and that paper sacks may be substituted. It should be noted that the importation of sugar into the area by our forces may provide a source of some of the cotton sacks needed.

Table 6.

FORESTRY TOOL REQUIREMENTS

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Item and Specification	Quantity	Tonnage without handles
<u>STEEL WEDGES - Wood Chopping</u> (Bernabe p. 276 fig. 2024)		
5 1/2 lb. size 9 1/2" long	2,400	6.5
<u>AXES - Italian type - oval hole</u> (Bernabe p. 275 fig. 2019)		
3 lb. type	15,000	22
<u>HARD PRUNING SHEARS</u> (Bernabe p. 274 fig. 991)		
8" long	5,000	5
<u>SAW FRAMES - with corresponding blade -</u> (Bernabe p. 570 fig. 349)		
for blade 30" x 1 1/4"	2,500	4
<u>BAND SAWS - In rolls of 360 ft. standard teeth -</u> (Bernabe p. 574 fig. 3531)	(in ft.)	
3/8" wide x 23 1/2 BWG thick	2,500	
1" " x 22 " "	12,000	
1 3/4" " x 21 " "	35,000	8
2 1/4" " x 19 1/2 " "	2,000	
<u>TWO MAN SAWS - Oval shape</u> (Bernabe p. 573 fig. 3527)		
4 1/2" long	5,000	9

<u>5 1/2 lb. size 9 1/2" long</u>	2,400	6.5
<u>AXES - Italian type - oval hole</u> (Bernabe p. 275 fig. 2019)		
<u>3 lb. type</u>	15,000	22
<u>HAND PRUNING SHEARS</u> (Bernabe p. 274 fig. 991)		
<u>8" long</u>	5,000	5
<u>SAW FRAMES - with corresponding blade -</u> (Bernabe p. 570 fig. 3495)		
<u>for blade 30" x 1 1/2"</u>	2,500	4
<u>BAND SAWS - In rolls of 360 ft. standard teeth -</u> (Bernabe p. 574 fig. 3531)		
<u>3/8" wide x 23 1/2 EWG thick</u>	2,500	
<u>1" " x 22 " "</u>	12,000	
<u>1 3/4" " x 21 " "</u>	35,000	8
<u>2 1/2" " x 19 1/2 " "</u>	2,000	
<u>TWO MAN SAWS - Oval shape</u> (Bernabe p. 573 fig. 3527)		
<u>4 1/2" long</u>	5,000	9
<u>PRUNING SAWS</u> (Bernabe p. 294 fig. 2193)		
<u>14" blade</u>	5,000	2
<u>HAND SAW</u> (Bernabe p. 512 fig. 3520)		
<u>24" blade</u>	1,500	1.5

(iii) To insure the maximum use of existing containers in the area, and to maintain the utility of those to be imported the programme provides for the special types of thread and needles needed to repair the sacks.

(iv) The protective coverings provided include tarpaulins, binder and other harvesting canvas. The potential spoilage through failure to protect crops from the elements would eventually result in far greater import tonnage for food than for coverings themselves. It is also apparent that areas liberated from enemy occupation are notoriously deficient in such coverings because of the fact that very little, if any, has been made available to the civilian economy since the outbreak of the war. There has probably been some Army requisitioning as well. The yardage provided in the programme is far below any requirements based on crop yields. Some part of the additional need may be provided for through the repair materials on the programme.

(v) Light canvas is a special requirement for the harvesting of olives. A canvas is spread under the trees and the crop yield will not approach the needed goals unless the traditional harvest technique is permitted to be carried out. The amount programmed makes adequate allowance for some existing stocks and for savings through repair.

(vi) In connection with the repair of containers and coverings no provision has been made for other than hand-sown repairs. The volume of repair work which should be carried out suggests that sewing machines could profitably be provided. It is known that repair of sacks and harvesting canvases has previously been made with machines in these areas. The data which will aid in the programming of sewing machines, parts and needles is given in case importation of such items is deemed desirable.

Table 7.

TEXTILE SUPPLIES REQUIRED

Item and Specification	Quantity	Tonnage
<u>JUTE SACKS - (To be ordered in U.K.)</u>		
100 lb. capacity average weight 1 lb. each	125,000	125 125.50
<u>COTTON SACKS</u>		
100 lb. capacity average weight 1 1/2 lb. each	250,000	56
<u>TARPAULINS</u>		
Size : 23 ft. x 16 ft. 5 inches average weight 8 1/2 lbs.	2,000	85
<u>HARVESTING CANVAS - Coverings, etc.</u>		
Quality : 1/2 wide number duck Width : 52" Ounces per yd. 24.09 Construction : 10 x 33	-----	50
<u>LIGHT CANVAS - (Cilves)</u>		
Quality : Waste duck Construction : 72 x 23 Width : 58" Ounces per yd. 12	-----	10
<u>BINDER TWINE (To be ordered in U.K.)</u>		2,000
<u>JUTE THREAD (To be ordered in U.K.)</u>		
No. 8 3 pl. No. 10 2 pl.		75
<u>CLOSING THREAD (To be ordered in U.K.)</u>		
No. 60 - Color - Brown (Put up in balls with paper core)		2
<u>SEWING THREAD (To be ordered in U.K.)</u>		
No. 12 - 4 cord - Tensile strength - 3 lbs. (Put up on small card board tubes containing 1/2 lb each)		1
<u>NEEDLES - (To be ordered in U.K.)</u>		
No. 14 Suitable for hand sewing heavy cloths	100,000	0.2
<u>BELTING</u>		

Quality : wide number duck		
Width : 5"		
Ounces per yard 24.09		
Construction : 10 x 3		
<u>LIGHT CANNES - (C.I.V.S.)</u>	-----	50
Quality : wide duck		
Construction : 72 x 22		
Width : 5"		
Ounces per yd. 12		
<u>BLINDER TWINE (To be ordered in U.K.)</u>	-----	10
		2,000
<u>JUTE THREAD (To be ordered in U.K.)</u>		
No. 8 3 pl.		
No. 10 2 pl.		
<u>CLOSING THREAD (To be ordered in U.K.)</u>		75
No. 60 - Color - Brown.		
(Put up in bails with jute core)		
<u>SEWING THREAD (To be ordered in U.K.)</u>		2
No. 12 - 4 cord - Tensile strength - 8 lbs.		
(Put up on small card board tubes containing 1/2 lb each)		
<u>NEEDLES - (To be ordered from B.I.C.)</u>		1
No. 14		
<u>Suitable for hand sewing heavy cloths</u>	100,000	0.2
<u>BELTING</u>		
Leather and/or canvas and/or rubber		
Weight : 1/2 lb. per 1" width per foot		
2"	14	
3"	36	
4"	28	
5"	19	
6"	13	
	Approximate relative percentages	10

Table 7 (Cont'd)

TEXTILE SUPPLIES REQUIRED

Item and Specification		Tonnage
<u>MULTIWALL KRAFT PAPER SHIPPING SACKS</u>		
Weight 72 Grams M2.		
5 Walls, open mouth sewn with bellows	20" x 40" 15%)	300
4 " " " "	20" x 40" 40%)	
5 " " " "	20" x 44" 40%)	
4 " " " "	20" x 44" 5%)	
<u>WRAPPING PAPERS.</u>		
Simili kraft sheets - 25 1/2" x 39 1/3" 50 x 70 Grams M2.		30
White wrapping - In rolls 18" diameter, 40" wide or Sheets 25 1/2" x 39 1/3"		500
Grease proof - Sheets 25 1/2" x 39 1/3"		50
<u>Blue wrapping - Sheets 25 1/2" x 39 1/3"</u>		25
<u>CARTONS FOLDING</u>		
Sheets 30 1/2" x 42" - 300 Grams M2		50
" 30 1/2" x 42" - 400 " "		20
<u>SEWING MACHINES FOR SACK REPAIR - Singer 133 - K. 13 or Singer 45 - K. 76</u>		All machines to be ordered in U.K.
Average weight - 50 lbs. each		
for repairing tarpaulins		
Singer 45 - K. 5		
Average weight - 50 lbs. each		
for sewing and closing sacks.		
"Union Special"		
Average weight - 50 lbs. each		
<u>SPARE PARTS FOR SEWING MACHINES</u>		For British made machines to be ordered in U.K.
Needed - approximately an average of 1 kilo of spare parts per machine per year to keep up much used machines.		
<u>NEEDLES FOR REPAIR OF SACKS - to be used with the corresponding type of sewing machine.</u>		
Nos. 28, 29, 30.		
<u>NEEDLES FOR REPAIR OF TARPULINS - to be used with the corresponding type of sewing machine</u>		
Needle No. 26		

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50

25

Blue wrapping - Sheets 25 1/2" x 39 1/3"
CARTONS FOLDING

Sheets 30 1/2" x 42" - 300 grams 12
" 30 1/2" x 42" - 400 " "

50

20

SEWING MACHINES FOR SACK REPAIR - Singer 133 - K. 13 or
Singer 45 - K. 76 All machines to be
ordered in U.K.

Average weight - 50 lbs. each

for repairing tarpaulins

Average weight - 50 lbs. each
Singer 45 - K. 5

for sewing and closing sacks.

"Union Special"

Average weight - 50 lbs. each

SPARE PARTS FOR SEWING MACHINES

For British made machines to be
ordered in U.K.

Needed - approximately an average of 1 kilo
of spare parts per machine per year
to keep up much used machines.

NEEDLES FOR REPAIR OF SACKS - to be used with the corresponding type of

Nos. 28, 29, 30.

sewing machine.

NEEDLES FOR REPAIR OF TARPULINS - to be used with the corresponding type
Needle No. 26 of sewing machine

NEEDLES FOR SEWING SACKS AND CLOSING SACKS - to be used with the corresponding
type of sewing machine.

Needle No. 10 and No. 12 and Excelsior H.156 - for sewing sacks,
Needle No. 12 and No. 14 and Excelsior H.156 - for closing sacks.

ALL NEEDLES TO BE ORDERED IN U.K.

An average of 12 needles per machine per year is needed.

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9.

Insecticides, Fungicides and Other Chemicals.

Copper sulphate is of great importance both for viticulture and vegetable production. If the facilities are available, copper scrap may be used in its production. Before the war Italy exported copper sulphate. It is assumed that war conditions disrupted same.

Lead arsenate is used for leaf and fruit-eating insects such as small worms that gets into the fruits shortly after blossoming. The amount is conservatively based on pre-war consumption. Aluminum arsenate or calcium arsenate may be substituted, the latter in double the weight.

Carbon tetrachloride is a useful insecticide and is used for fumigating and preserving grain. The estimated amounts given for this chemical and for carbon disulphide, trichloroethylene and benzene are considered as minimum based partly on North African experience. The latter three chemicals are used principally in the extraction of edible olive oil, a vital product in the Sicilian and Southern Italian economy.

Anhydrous ammonia and calcium chloride are essential for refrigerating processes, the manufacturing of a tone of ice calling for 350 grams of calcium chloride, 75 grams of anhydrous ammonia and 10 grams of sodium chloride.

The low water content of the sea, including Naples and Palermo, will probably require more information than the chemicals program will provide.

White oil, which is concentrated, is essential for the spraying of citrus trees. It is not listed because there is no record of any importations. It seems probable that it will be produced as a by-product of the asphalt bituminous refining process in Sicily.

Amounts and delivery requirements of the above chemicals are listed in table.

Lead arsenate is used for leaf and fruit-eating insects such as a small worm that gets into the fruits shortly after blossoming. The amount is conservatively based on pre-war consumption. Aluminum arsenate or calcium arsenate may be substituted, the latter in double the weight.

Carbon tetrachloride is a general insecticide and is used for fumigating and preserving grain. The estimated amounts given for this chemical and for carbon disulfide, trichloroethylene and benzene are considered. Trichloroethylene based partly on North African experience. The latter three chemicals are used principally in the extraction of edible olive oil, a vital product in the Sicilian and Southern Italian economy.

Alkylated amines and calcium chloride are essential for refrigerating processes, the manufacture of a tone of ice calling for 350 grams of calcium chloride. 75 grams of anhydrous ammonia and 12 grams of sodium fluoride.

The low cost of these chemicals, including Naples and Palermo, is probably because of a combination of the chemicals programmed with quantities.

White oil which is used for the manufacture of the spraying of citrus trees, is not listed because there is no record of any importations. It seems probable that it is produced as a by-product of the asphalt distillation and is sold locally.

Amounts are given in the schedule of the above chemicals are listed in Table C.

TABLE 8

AMOUNTS OF INSECTICIDES, FUNGICIDES, FUMIGANTS
AND OTHER CHEMICALS REQUIRED FOR IMMEDIATE AND
SUBSEQUENT DELIVERIES.

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Chemical	For Immediate : Subsequent		Date	
	Delivery	Deliveries	Amount : Arrival	Amount : Arrival
	(Metric tons)	(Metric tons)		
Ammonium Sulphate or/ Equivalent Ammonium Nitrate	12,000	26,000	November	Jan. Feb.
Ammonium Nitrate	2,000	1,000	November	Jan.
Sodium Nitrate	2,000	4,000	November	Jan. Mar.
Copper Sulphate	4,000	12,000	December	Jan. Mar.
Lead Arsenate	100	500	November	Jan. Mar.
Carbon Tetrachloride	50	100	November	Jan. Mar.
Carbon Disulphide	200	100	November	Jan.
Trichlorethylene	300	200	November	Jan. Feb.
Benzene	40		Nov. Dec.	
Anhydrous Ammonia	5	10		
Calcium Chloride	15	45		

NOTE: The chemicals to be used for ice manufacture are needed throughout the year with a seasonal increase during the

Ammonium Sulphate or / Equivalent Ammonium Nitrate	12,000	November	26,000	Jan. Feb.
Ammonium Nitrate	2,000	November	1,000	Jan.
Sodium Nitrate	2,000	November	4,000	Jan. Mar.
Copper Sulphate	4,000	December	12,000	Jan. Mar.
Lead Arsenate	100	November	500	Jan. Mar.
Carbon Tetrachloride	50	November	100	Jan. Mar.
Carbon Disulphide	200	November	100	Jan.
Trichlorethylene	300	November	200	Jan. Feb.
Benzene	40	Nov. Dec.		
Anhydrous Ammonia	5		10	
Calcium Chloride	15		45	

NOTE: The chemicals to be used for ice manufacture are needed throughout the year with a seasonal increase during the warmer months.

TABLE 2

IRON AND STEEL PRODUCTS REQUIRED.

Item and Specification.	Quantity (in feet)	Tonnage
<u>WIRE ROPE</u> - 6 strands - 19 wires each	1" - 225,000	41.46
	1" - 75,000	55
	3/4" - 40,000	
	1" - 20,000	
<u>STEEL PIPE</u> - Galvanized - British threaded & coupled	(in feet)	
2" & 3" nominal diameter	2" - 20,000	34)
5% by weight of fittings, elbows, tees, plugs	3" - 15,000	50) 84
<u>BOLTS & NUTS</u> - Flat head, countersunk with sidelug.		
square nuts		
1" x 1"	1" x 2")	4)
3/8" x 1"	3/8" x 1")	
	56,000 each size.	
1" x 1 1/2"	1" x 2 1/2")	8) 12
3/4" x 2"	3/4" x 3")	
	25,000 each size.	
<u>RIVETS</u> - Soft steel - for cold riveting - round head		
1" x 1", 3/8" x 1 1/2", 1" x 1 1/2" - 30,000 each size		
<u>WASHERS</u> - plain, back - 1/2", 3/8", 1", 3/4" diameter bolts & rivets - 25,000 each size.		2
<u>NAILS</u> - Common flat head - 1" x 16 Bwg Packed	200 kegs	1
1 1/2" x 14 " in 100 lb.	150 "	
2" x 12 " kegs	100 "	25
<u>WIRE</u> - Soft steel, black - 14 Bwg		40
<u>STEEL STRIP</u> - Soft, black - 1" x 17 Bwg		25
<u>ANIMAL SHOES</u> - 1/2 Fore, 1/2 Hind Horse - No. 00, No. 00, No. 00 (Bernabe p. 312)		15
	fig. 2775)	
Mule - No. 0, No. 01 (Bernabe p. 312)		5
Ox - No. 2, No. 3 (Pasquier, Jost et Cie)		25
<u>HORSE SHOE NAILS</u> - (Bernabe p 313, fig. 2277) Nos. 2 & 3		15
<u>MILD STEEL FLATS</u> - 1 1/2" x 1 1/2" x 3/16" and 2" x 2" x 3/16".		
25 tons of each size		50
<u>ANGLE IRON</u> - 1 1/2" x 1 1/2" x 3/16", 2" x 2" x 3/16"	25 tons of each size	50
<u>CORRUGATED GALVANIZED IRON SHEET</u>		

<u>STEEL PIPE</u> - Galvanized - British threaded & coupled	(in feet)	
2" & 3" nominal diameter	2" - 20,000	34)
5% by weight of fittings, elbows, tees, plugs	3" - 15,000	50) 84
<u>BOLTS & NUTS</u> - Flat head, countersunk with sidelug.		
square nuts		
1" x 1"	1" x 2") 56,000 each size.	4)
3/8" x 1"	3/8" x 1")	
1" x 1 1/2"	1" x 2 1/2") 25,000 each size.	8) 12
3/4" x 2"	3/4" x 3")	
<u>RIVETS</u> - Soft steel - for cold riveting - round head		
1" x 1", 3/8" x 1 1/2", 1" x 1 1/2" - 30,000 each size		2
<u>WASHERS</u> - plain, back - 1/2", 3/8", 1/2", 3/4" diameter bolts & rivets - 25,000 each size.		1
<u>NAILS</u> - Common flat head - 1" x 16 Bwg Packed	200 kegs	
1 1/2" x 14 " in 100 lb.	150 "	
2" x 12 " kegs	100 "	25
<u>WIRE</u> - Soft steel, black - 14 Bwg		40
<u>STEEL STRIP</u> - Soft, black - 1" x 17 Bwg		25
<u>ANIMAL SHOES</u> - 1/2 Fore, 1/2 Hind Horse - No. 000, No. 00 (Bernabe p. 312) fig. 2775)		15
Mule - No. 0, No. 01 (Bernabe p. 312)		5
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<u>CORRUGATED GALVANIZED IRON SHEETS</u>		
32" wide after forming - 10 - 3" corrugations		
23 Bwg - 6-10" long, with ridge tools, nails & washers		100
<u>BARBED WIRE</u> - galvanized - 4 points - 5" spacing - 12 1/2 Bwg		
80 rod spools		50
<u>POULTRY NETTING</u> - Hexagonal galvanized		
2" mesh - 19 Bwg - 36" wide - 150' rolls		25
<u>STRAIGHT LINK CHAINS</u> - Electric welded, polished not galvanized (in feet)		
(Bernabe p. 59, fig. 214)		
11 Bwg link wire chain	250,000)	
3 Bwg " " "	140,000)	43
000 Bwg " " "	35,000)	
<u>PLOUGHSHARE</u> - Quality steel sheets		
3' x 6' x 5/16" thick		25

10. Iron and Steel Products

The comparative of mechanization in the area's agriculture (Sicily is reported to have had only 700 agricultural tractors) does not reduce the need for iron and steel products.

The maintenance of implements, animal-drawn vehicles and farm facilities cannot be accomplished without the importation of semi-processed metals. Equally the distribution of agricultural products cannot be achieved without certain metal products.

The end-uses justifying the iron and steel items on the programme are as follows.

<u>Product</u>	<u>End-Use</u>
Wire Rope	Haulage and harness
Steel Pipe	Irrigation
Bolts and Nuts	Implement and vehicle repair
Rivets	" " "
Washers	" " "
Nails	Packing case closure
Wire	Baling
Steel Strip	Packing case closure
Animal Shoes	Farm animals
Horse Shoe Nails	" "
Mild Steel Plates	Implement and vehicle repair
Angle Irons	" " and posts
Corrugated Iron Sheets	Roofing
Barbed Wire	Enclosure
Poultry Netting	"

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The choice of the particular items and the standardized types and sizes indicated reflect North African experience.

The quantities shown in Table 9 on the preceding page are approximately one-third to one-half the estimated normal requirements.

In summary it is emphasized that estimates of production input requirements contained in this memorandum are considered to be minimum needs to make as much food as possible available from occupied areas. Additional supplies will have to be requisitioned for crops to be planted in the spring of 1944 and thereafter.

Bolts and Nuts
Rivets
Washers
Nails
Wire
Steel Strip
Animal Shoes
Horse Shoe Nails
Mild Steel Plates
Angle Irons
Corrugated Iron Sheets
Barbed Wire
Poultry Netting

Implement and vehicle repair
" " "
" " "
Packing case closure
Baling
Packing case closure
Farm animals
" "
Implement and vehicle repair
" " and posts
Roofing
Enclosure
"

The choice of the particular items and the standardized types and sizes indicated reflect North African experience.

The quantities shown in Table 9 on the preceding page are approximately one-third to one-half the estimated normal requirements.

In summary it is emphasized that estimates of production input requirements contained in this memorandum are considered to be minimum needs to make as much food as possible available from occupied areas. Additional supplies will have to be requisitioned for crops to be planted in the spring of 1944 and thereafter.

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Acting Director, Agriculture A.C.

