FARMERS CONFRONTED WITH SERIOUS PROBLEM IN FERTILIZER SHORTAGE

Secretary of Agriculture Makes a Statement Regarding the Supply of Potash, Phosphate and Nitrogen—Importation of Potash Is Cut Off as Result of European War—Conservation of Fertilizer Material Is Recommended.

Washington.—The secretary of agriculture makes the following statement regarding the fertilizer situation:

American farmers are confronted by a serious situation in reference to fertilizer materials. As a result of the embargo placed by the German government on the exportation of potash, the supply of this substance has been entirely cut off. Under normal conditions sulphuric acid, which is required for making super-phosphates, is sold for $5 or $6 a ton. The increased demand for it since the breaking out of the European war has caused the price to rise to about $25 a ton. It is impossible therefore for farmers to secure super-phosphates at prices which they have been accustomed to pay. The nitrogen supply is not materially less than usual.

In 1913, when conditions were normal, about $125,280,000 worth of commercial fertilizers was used in the United States. Of this amount, the farmers paid $48,830,000 for nitrogenous substances, $56,000,000 for phosphates, and $20,450,000 for potash salts. Practically all the potash salts were imported from Germany and the entire quantity of nitrate of soda came from Chile. Ammonium sulphate to the value of $3,720,000 was received from abroad, mainly from England. The remainder of the fertilizer materials was derived from domestic sources.

The Potash Situation.

There is practically no potash in this country at the present time for fertilizer use. The small quantities which were held over from former years are now priced at from eight to twelve times their normal value. The investigations of the department and the geological survey have shown the possibility of producing from American sources an ample supply of potash salts for domestic consumption. These sources are: The giant kelp of the Pacific coast from lower California to Alaska; the alunite deposits, mainly in the mountains of Utah; the feldspathic rocks of the eastern part of the United States, and the mud of Searles lake, in California.

The production of potash from feldspar is commercially feasible if a salable by-product can be secured at the same time.

The development of Searles lake as a source of potash presents a number of unsolved technical problems.

Alunite, a mineral which exists in considerable quantities in Utah and neighboring states, contains about 11 per cent of potash. It is decomposed by roasting at a temperature of about 700 degrees, with the evolution of oxids of sulphur, and a residue consisting of alumina and potassium sulphate remains. From this residue the potash salt can be obtained readily by leaching and evaporation. The process is simple. The fumes liberated can be used to manufacture sulphuric acid. Alumina resulting as a by-product will be suitable for the manufacture of metallic aluminum.

Giant Kelp Beds.

An ample supply of potash for the needs of farmers can be obtained from the giant kelp beds. These beds have been surveyed by the bureau of soils and a report, accompanied by maps showing in detail their extent and location, recently has been issued. Harvesting is accomplished easily, as the kelp grows in open water and barges fitted with mowing attachments can be used.

For utilizing the kelp several methods are feasible. It may be dried and ground. In this condition it contains all the salts originally present, which are mainly potassium chlorid and sodium chlorid. This material has ideal mechanical properties for use in mixed fertilizers. When the pure potassium chlorid is desired it is necessary to separate the juice from the organic material and then to remove the sodium chlorid. The latter can be done readily by recrystallization; but the separation of the juice from the organic material is more difficult, for the reason that the kelp is nonfibrous and in attempts to effect separation by filtration the filters become clogged and unworkable. The problems yet to be worked out commercially are the best methods of drying the wet kelp and of effecting the ready and efficient separation of the plant juices from the organic material. Investigation of these questions has proceeded far enough to indicate that their solution should not be very difficult.

Output Will Be Diverted.

Three large concerns have begun operations for the manufacture of potash from kelp. While potash is indispensable in the preparation of fertilizers, it is also used for many other purposes, including the manufacture of matches, glass, liquid soap, and munitions. The prices offered under existing conditions by the manufacturers of such articles undoubtedly will cause practically the entire output of these concerns to be diverted from the fertilizer industry. It seems unlikely that normal conditions will be restored in the immediate future and that potash can be secured from foreign sources as heretofore in time for the next crop planting season. It also seems improbable that private enterprise will provide potash from domestic sources for agricultural purposes in time. It would require ninety or more plants, costing approximately $50,000 and having an operating capital of about $25,000 each to produce the quantity needed for agriculture. This would involve the assumption that the commercial phases of the problem were satisfactorily solved. Even if the requisite funds were available, it is a question whether operations could begin in time to provide an adequate supply for the coming year. The department is investigating all aspects of the question and is planning to send experts to California to study the situation and especially to consider possibilities of production on a commercial scale.

The Phosphate Situation.

Acid phosphate is the basis of nearly all commercial mixed fertilizers. It is made by the action of sulphuric acid upon phosphate rock. Our available sources of phosphate rock are greater than those of any other nation. The main supply for domestic consumption and for exportation comes from Tennessee, South Carolina and Florida.

In 1914, 2,734,000 tons of phosphate rock were produced in this country. Up to that year about one-half the quantity mined was exported to Europe. The rock in its natural state is not readily absorbed as a plant food. It is made available for this purpose by treatment with sulphuric acid, about one ton of the acid being used to a ton of phosphate rock. When thus treated, a super-phosphate containing 14 to 18 per cent of water-soluble phosphoric acid is made. The bulk of the sulphuric acid which enters into the manufacture of acid phosphate is made by fertilizer companies. Practically every fertilizer establishment (excepting the cottonseed meal factories) having an annual capacity of 15,000 tons or more operates also a sulphuric acid plant. The demand for the acid is so strong at present that every effort is being made to utilize old and abandoned establishments and to erect new plants.

The potential sources of sulphuric acid in the United States are ample to produce more than double the present annual output. Few of the lead, zinc, or copper smelting companies using sulphide ores have sulphuric acid plants in connection with their smelters. The fumes discharged into the atmosphere by these smelters are sufficient to produce many thousands of tons of sulphuric acid daily. Under normal conditions, the limited market for the acid and the long haul necessary to reach the market have made it commercially impracticable to convert the fumes into sulphuric acid.

Involves Big Outlay.

The erection of acid plants of sufficient capacity to convert the smelter gases would involve an outlay of at least several million dollars. Under normal conditions it would take four months to complete the plants. In the present situation, at least six months would be required. The bureau of soils estimates that sulphuric acid could be made by some of the western smelting plants at approximately one-half the normal cost of producing the acid in the East where pyrites are used. The saving in cost of manufacture in the West, however, would be partly offset by the long haul necessary to bring the acid to the eastern market.

In view of the difficulties in the way of the production and utilization of sulphuric acid for fertilizer purposes, the bureau of soils has endeavored to develop a commercial method, involving the use of the electric furnace, for manufacturing phosphoric acid, which can be used as a substitute. Through this method double super-phosphate, which will contain 40 to 50 per cent of water-soluble phosphoric acid, or the still more concentrated form of ammonium phosphate, could be secured. But the use of the electric furnace for the purpose is commercially feasible only where phosphate rock, coal, and cheap water-power are readily available. The department is investigating this matter to ascertain whether there are localities where these conditions exist and where, therefore, double super-phosphate may be made.

The Nitrogen Situation.

The nitrogen situation is of less pressing concern. Cottonseed meal forms the bulk of the nitrogenous substances entering into commercial fertilizers. The amount available for fertilizer use is dependent upon the annual production of cotton and the demand for the meal for feeding stuffs. The supply of dried blood and tankage, also sources of nitrogenous material, is dependent upon the number of animals slaughtered. Only a few large packing concerns conserve these products, which are now used to a considerable extent as cattle feed as well as for fertilizer purposes. Investigations of the bureau of soils have shown that there is a large amount of waste from the fisheries and fish canneries, especially on the Pacific coast and in Alaska. This material could and should be made into fish scrap, which would have a value of about $1,200,000 for fertilizer purposes.

Owing to the demand for nitric acid for munition purposes, the price of nitrate of soda advanced approximately $1.10 per hundred pounds during the year prior to November, 1915. Only a very small percentage of the nitrates imported from the Chilean beds goes into fertilizers, being mainly incorporated in special brands for greenhouse and trucking purposes. This item alone, therefore, will not cause much embarrassment to American farmers.

By-Product of Coal.

One of the most important sources of nitrogen for commercial fertilizer purposes is ammonium sulphate This is produced as a by-product in the destructive distillation of coal for the preparation of coke. The nitrogen contained in the coal is evolved as ammonia and is caught and neutralized with sulphuric acid. Formerly all coke was made in the beehive oven, which did not provide for the confinement of the combustible gases produced. These were burned as evolved and the ammonia carried by them was likewise lost. The domestic production of ammonium sulphate from the coke oven is only one-fifth of what it could be were the beehive oven entirely displaced by more modern types. During the past few years there has been a slow transition from the use of the beehive oven. It is not imperative, therefore, to resort to extreme measures to increase the production of ammonia.

Another source of nitrogen is found in garbage. The investigations of the bureau of soils indicate that if the garbage of all cities having a population of 30,000 and over were converted into garbage tankage, the product would be worth for fertilizer purposes at least $3,500,000. In view of the present situation, immediate steps should be taken by all municipalities to conserve the garbage and to make it available for use in the fertilizer trade.

The bureau of soils is studying also the problem of the fixation of atmospheric nitrogen with a view to develop a method for the production of ammonium phosphate and other forms of concentrated fertilizers. No ammonium phosphate is being made in this country at the present time. If cheap water power, phosphate rock, coal, and limestone can be found in accessible localities, the possibility of making this material on a commercial scale is considered entirely feasible. The greatest difficulty here is to discover cheap water power at points where phosphate rock, coal, and limestone are readily available. The department is making every effort to locate available sources of developed water power which can be used in the manufacture of ammonium phosphate and other fertilizers.

It must not be understood that the suggestions which have been made, or the efforts which are now being put forth, will result in immediate relief for farmers. There is a number of technical problems which have to be solved if these fertilizers are to be produced on a commercial scale, and, even if the funds for the necessary plants were provided, either from private or public sources, considerable time necessarily would be required for the erection of the plants and for their full operation.

Save Fertilizer Elements.

In the unusual conditions existing in the fertilizer trade, it is important that all fertilizing materials on the farm, especially those containing potash, should be conserved. The fertilizer ingredients already existing in the soil should be utilized and developed to the fullest extent. A great deal can be accomplished in this direction by deep plowing, constant cultivation, and thorough tillage. There should be a proper system of rotation. Especially where one crop has been grown for several years a different one should be planted this year. Green manures and cover crops should be used as much as possible in their proper rotation.

Of the organic substances, manure, both solid and liquid, is the most important and should be utilized wherever possible. All material of an organic nature, such as leaves and bedding of various sorts, should be composted and the compost applied to the soil. Special attention should be given also to the conservation of wood-ashes. Depending on the character of the wood, they contain potash in quantities varying ordinarily from three to ten per cent. All tree trimmings, brush cuttings, etc., should be burned and the ashes derived therefrom utilized.

The application of lime to many soils is of undoubted benefit. Though the availability of the fertilizing elements in the soil may not be greatly increased by its use, the resulting improvement in physical and bacterial conditions may increase considerably the productiveness of the soil.

Farmer Buried Alive.

Warsaw, Ind.—Martin Greenbaum, a farmer, narrowly escaped death under a strawstack. Cattle had burrowed in the stack so that it threatened to topple over. Greenbaum attempted to prop up the stack and was caught under it when it collapsed. He was dug out two hours later by relatives, who missed him and who had found him under the straw after a long hunt. He was almost suffocated when rescued.

Found an Old Cowbell.

Conyers, Ga.—H. C. Penn has in his possession a cowbell found by him in Ben Carr bottoms in the year 1856. The bell is of brass, and unlike most small bells now, is made of one solid piece of metal.

The KITCHEN CABINET

Any man may be in good spirits and good temper when he is well dressed. If I was very ragged and very jolly then, I should begin to feel I had gained a point.—Dickens.

HELPFUL HINTS.

If the range is too low raise it on a zinc-covered platform. A low stove

is a back-breaking addition to an already burdened one.

A rubber mat placed before the sink is a great help to tired feet, as it lessens fatigue. When standing on concrete floors have, if a rubber mat is not to be procured, a small rack of strips of board on which to stand. There is sufficient spring in the device to ease the feet.

Doors and window casings, moldings and baseboards should be smooth so as not to afford a place for dust in cracks and ledges.

Whenever possible the wood or coal should be filled from the outside into a box near the stove with a cover to keep out the dust.

Dustless mop cloths, and dusters are easily prepared at home. Old woolen or flannelette underwear for mops and cheesecloth dusters are prepared as follows: Put a quarter of a cupful of kerosene into a cleaning pail, add two quarts of quite warm water, put in the cloths and make sure that they are well saturated. Wring out, dry and the cloths are ready for use. Keep in metal receptacles or in an airy place as they are inflammable.

The best sanitary covering for the floor is linoleum. Varnished once or twice a year, it lasts for years. It should be well fitted with watertight joints. The method used by some is to lay the cloth and use it until it is well flattened and stretched before tacking securely.

A painted floor if kept well painted, may be easily cleaned. Use the same color of paint from year to year, then the worn spots may be recoated without being too noticeable.

A zinc-covered table of the right height for the person to use is an indispensable kitchen adjunct. A hinged shelf placed conveniently is another help in serving and dishwashing.

A wire tray to fit into a deep pan may be used for the drained dishes. Scald with very hot water and let dry, saving the process of wiping.

TASTY CHEAP MEATS.

Those who would serve meats that take long, slow cooking must plan

their meals some time beforehand.

All meats should be immediately removed from their paper wrappings, as much of the juice soaks into the paper. The paper itself often imparts an unpleasant flavor to meat. Keep meat near ice or in a cold place and wipe it with a damp cloth before putting it on to cook.

Red meats are easier of digestion, if properly cooked, than the white meat of pork and veal.

Far more meats are spoiled by too intense heat than by too little.

The liquor in which fresh meat has been boiled makes good foundation for soups and broths.

Salt meats should be put into cold water to cook, changing the water if the meat is very salt. This liquor is good to make bean or pea soup. Never throw away a bit of meat liquor, for there is any number of ways of using it in gravies, sauces and for flavor in vegetable dishes.

Twenty minutes to the pound is considered good time to cook meat well done, usually not counting the time until after the first twenty minutes, as it takes that time for meat to become heated.

In cooking meats one of two things must be decided by the housekeeper, time or money, which to you is the most valuable. Chops and steaks are quickly prepared, but are expensive. We must remember that the most costly meat is not the most nourishing, as much of the best flavor and nutriment is found in the cuts taken from the part of the animal where the muscles are most active. This meat is the lowest in price.

In steaming meat there is less loss; in stewing it, about a fourth of its weight is lost in cooking. When steaming 30 minutes to the pound should be allowed in the cooking.

A small amount of meat will flavor a dish of vegetables, cooking together in the oven.

EGGLESS DISHES.

With eggs soaring higher and higher these days we must of necessity curtail their use, and yet the family must have the sweet things and be supplied with a variety. A most delicious pudding, which needs long, slow baking, is this:

Rice Pudding.—Take a fourth of a cupful of rice, a half cupful of sugar and two quarts of rich milk with a half cupful of raisins or a few sliced sweet apples, put into a baking dish and set into the oven. Stir often for the first hour or two, then let it brown. Bake for three hours. This is delicious without sauce, but a hard sauce flavored with nutmeg makes it a dessert liked especially by the children and is a most wholesome one for them.

Molasses Cookies.—Take a cupful of shortening, a cupful of molasses and a cupful of brown sugar. Heat in a saucepan until well mixed, then add ginger or other spices to taste, a half teaspoonful of soda, dissolved in a little hot water and flour enough to roll out. If the mixture is cooled well before rolling it will handle better.

Apple Sauce Cake.—Take a cupful of brown sugar, a half cupful of shortening, a cupful of unsweetened apple sauce, made from cooking apples, a cupful of raisins, chopped, two teaspoonfuls of cocoa, a teaspoonful of cinnamon, a half teaspoonful each of cloves and nutmeg, two cupfuls of flour, sifted with a half teaspoonful of soda, and one teaspoonful of baking powder. Bake forty minutes in a shallow pan. This makes a good dessert served with a lemon sauce or any desired flavor.

Winter Shortcake.—Prepare a rich baking-powder biscuit dough; make two cakes, rolling thin, spread one with butter and place the other on top, then when baked they are easily split without making them heavy. Use canned peaches, sliced oranges, or bananas or any fruit desired. Serve with cream and sugar.

This same biscuit dough rolled thin, sprinkled with brown sugar and nuts, rolled, then cut like cinnamon rolls and baked are delicious little cakes for tea.

VARIATIONS IN DRESSINGS.

The simple French dressing made with three tablespoonfuls of oil to

one of sharp vinegar, a dash of cayenne and powdered sugar and a teaspoonful of salt may be added to as to flavor by a few finely chopped stuffed olives.

For cucumber salad a hard cooked egg, minced fine, added to the French salad dressing is especially good. Chopped chives and dressing served on cottage cheese is another good combination

Chili sauce, tabasco, Worcestershire, catchup of various kinds are all good in French dressing.

Pineapple Dressing.—Mix all of the following ingredients in a double boiler and cook until thick: two egg yolks, two tablespoonfuls of sugar, one-half of flour, and one-half cupful of pineapple juice. When serving with a fruit salad thin with cream or condensed milk.

Boiled salad dressing is very good on cottage cheese.

Chili Dressing.—Make an ordinary French dressing as above, add a few drops of onion juice, get this by scraping with a spoon the cut side of an onion. When ready to serve, add finely chopped green peppers and enough chili sauce to color the dressing a rich red. Shred cabbage very fine and mix with the dressing.

Thousand Isle Dressing.—There seems to be as many varieties of this dressing as there are islands. To a mayonnaise dressing add whipped cream, chopped parsley, stuffed olives, hard cooked eggs and chives. Pour over head lettuce.

Some mashed roquefort cheese with seasonings added to French dressing on head lettuce.

For mayonnaise the chief success in its making is that dishes and ingredients are well chilled with ice, otherwise the dressing separates.

Mustard is liked with meats and vegetables, but is not used in fruit salad dressings. Many other combinations will occur to the cook who is thinking about attractive dishes

Nellie Maxwell

BITS OF INFORMATION

Cape Cod was once an island.

An Austrian countess has contributed 5,000 cork legs to wounded soldiers. Jean de Reszke, the famous tenor, has given 50,000 cigarettes to the wounded allies.

Wine tasters, employed in their professional duties, never swallow the wine they taste. They merely hold a sip of the beverage in the mouth for a few moments and breathe through the nostrils.

There has been organized in Yucatan an association of sisal hemp producers along the lines of the California Fruit Growers' association, its purpose being to enable each hemp producer to obtain a fair price for his product at all times, regardless of speculation.

Tyler Parker, aged seventy-seven, who laid down his type stick at Montgomery, Mo., recently, after serving 62 years at the "case," is supposed to hold the American record for length of service in typographical pursuits.

Better think three times before extracting a dollar from your pocket to invest in a get-rich-quick proposition.

One Exception.

Mrs. Plaindial—I don't care if I'm not pretty. Beauty's only skin deep.

Her Husband—Not with potatoes.

Should Wear a Skull Cap.

"How did Teller get his cold?"

"All the drafts in the bank go through his cage."

Versatile.

"The weather is pretty changeable in this part of the country," remarked the Californian.

"Yes," replied the New Yorker. "We strive to please everybody."