THE PRODUCTION AND HANDLING OF GRAIN IN ARGENTINA.

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NOTWITHSTANDING the fact that about 70 per cent of the corn grown in the world is produced in the United States, the surplus for export has decreased in recent years to such an extent as to permit importations of this cereal. These importations have been made chiefly from Argentina, which is the principal corn-surplus producing country of the world. The importation of corn from Argentina began as early as 1909, although only relatively small quantities were received until the latter part of 1913, at which time the imports showed a decided increase. Several cargoes each month were received until the outbreak of the European war, since which time importations have been received only occasionally.

The corn imported prior to 1913 was used primarily for manufacturing purposes, and comparatively little, if any, found its way into the interior of the country until the winter of 1913-14. However, the bulk of the corn imported from Argentina has been ultimately exported from the United States in the form of manufactured products. The importance of the corn imports from Argentina is relatively small, when it is considered that the importations during the past seven years amounted only to approximately one-tenth of 1 per cent of the total production of corn in the United States during the same period.

It is very possible that Argentina will, with the return of more normal conditions in ocean freights, continue to send corn to this market, especially in years of decreased produc-
tion in this country. This, together with the fact that Argentina is taking a place of ever-increasing importance in the production of grain for export to the European markets, which also take most of the surplus grain from the United States, makes a discussion of the methods of handling grain in Argentina of considerable interest.

THE CEREAL REGION OF ARGENTINA.

Argentina occupies approximately the same position south of the equator as that of the United States north of the equator, the total area being nearly two-fifths the area of the United States. A conservative estimate of the area which might be used for agricultural purposes would be 250,000,000 acres, of which possibly 120,000,000 acres would then be available for cereal and flaxseed growing. At the present time there are cultivated slightly more than 60,000,000 acres, of which approximately 34,500,000 acres are devoted to wheat, corn, flaxseed, oats, barley, and rye.

Wheat growing in Argentina first began on a large scale in the Province of Santa Fe. In 1895 this Province produced about half of the wheat of the entire country. However, since that time the area devoted to wheat has gradually extended west into the Province of Cordoba and south into the Province of Buenos Aires. Each of these Provinces is now producing more wheat than the Province of Santa Fe. The Territory of La Pampa Central, which only a few years ago was not considered by many as having a very promising future in the production of cereals, is gaining in importance with great rapidity, and there is every reason to believe that in the not distant future this Territory will take first place in the production of wheat in Argentina. The present wheat belt extends from 30½° to 39½° south latitude.

The corn region, while more or less in the same general section as the wheat belt, is principally situated near the Parana River in the lower part of the Province of Santa Fe, and in the northern part of the Province of Buenos Aires. The center of corn production is at about 33½° south latitude.

Flaxseed is grown chiefly between 31° and 35° south latitude, the center of production being from one-half to three-
quarters of a degree nearer the equator than the center of corn production.

Nearly all of the oats in Argentina is grown in the Province of Buenos Aires between 34° and 39° south latitude. While oats is the fourth crop in point of acreage, there being only 2,500,000 acres utilized for its production, the increase in the oats area from 1895 to 1913 was over 3,000 per cent.

The production of barley and rye has not attained any great degree of importance in Argentina. The number of acres utilized for the raising of barley is approximately 418,000, and only 228,000 acres are devoted to the growing of rye. These two cereals are grown chiefly in the Province of Buenos Aires.

The region in which the cereals are cultivated extensively is known as the "Pampa," and is for the most part a vast fertile plain with a slight incline toward the sea. The cereal zone (Pl. LVII), which covers an area of approximately 160,000,000 acres, is included within the Provinces of Buenos Aires, Santa Fe, Cordoba, Entre Rios, and the Territory of La Pampa Central. The combined area of this entire region is, in round numbers, 205,000,000 acres. In addition to the production of over 500,000,000 bushels of grain and flaxseed, there are grown within the cereal zone more than 12,000,000 acres of alfalfa. Likewise, over one-half of the 110,000,000 head of cattle and sheep are raised in this same territory. In the principal part of the cereal zone there are usually no trees visible for miles, and then only such as have been planted around the dwelling houses or here and there a solitary "ombú" tree, with its gnarled roots protruding out of the ground. If this region were placed in the corresponding latitude in the United States, it would cover an area averaging about 425 miles wide and extending from the twenty-eighth to the forty-first parallel (Pl. LVIII).

The soil in this region is exceptionally fertile, a considerable portion being not unlike the rich soils of Illinois, both in productiveness and in appearance. The climate is mild, the temperature seldom rising above 95° F. in summer and rarely falling below 32° in winter, while snow is practically unknown.
IMPORTANCE OF CEREAL AND FLAXSEED GROWING.

Argentina has developed during the past 25 years from a country of little importance in the exports of grain and flaxseed to the most important of all of the surplus-producing countries. In 1891 only 17,500,000 bushels of grain and flaxseed were exported, of which 14,500,000 bushels were wheat, 2,500,000 bushels corn, and 500,000 bushels flaxseed. In the year 1913, after satisfying the domestic needs of the country, there remained for export nearly 397,000,000 bushels of grain and flaxseed.

The rapid increase in the production of grain and flaxseed and its importance as a factor in the national wealth of the country are better illustrated by comparing the value of the exports of the cereals and flaxseed with the export value of the products of stock raising, which is now the country's second greatest source of wealth. From 1896 to 1902, a period of 7 years, the value of the stock, meat, and by-products exported averaged slightly more than $84,500,000, while the average value of the grain, including wheat flour and of flaxseed sold abroad during the same period, was a little less than $50,000,000. From 1903 to 1907, a period of 5 years, the average value of the products of stock raising exported was, in round numbers, $116,500,000, as against $141,250,000, the average value of grain and flaxseed. The difference in favor of the cereals and flaxseed was even greater for the 6 years from 1908 to 1913, when the average value of the surplus grain and flaxseed was nearly $221,000,000, while the exports of live stock, meat, and by-products netted an average of $153,000,000.

The relative importance of Argentina in the world's international trade in corn, wheat, oats, and flaxseed is illustrated in Plate LIX. The information given in Plates LIX and LX is an average of the exports for the 3 years 1911, 1912, and 1913, with the exception of the exports of corn from Argentina, which is an average for the 2 years 1912 and 1913, the exports for 1911 being omitted in this case, owing to the fact that practically the entire crop of 1911 was lost.

Of the surplus corn-producing countries Argentina occupies first place, furnishing 54.9 per cent of the total international trade, the nearest competitor being Roumania, with
only 15.4 per cent. While Argentina occupies fourth place as a wheat-export country, furnishing 15.8 per cent of the total supplied by the 11 surplus wheat-producing countries, there is only a difference of 4.1 per cent between Argentina and Russia, the latter occupying first place, with exports equaling only 19.9 per cent. The United States occupies second place, supplying 18.1 per cent, and Canada is a close third, with 17.3 per cent. These four countries furnish 71.1 per cent of the wheat required by importing nations. During 1911, 1912, and 1913 there were exported from Argentina an average of nearly 53,000,000 bushels of oats, or 33 per cent of the total exported by the six surplus-producing countries, Russia being first, with 40.8 per cent. Argentina occupies first place in the exports of flaxseed, shipping 24,489,000 bushels annually, which is 46.9 per cent of the world's trade, the second place falling to British India, with exports equaling 33 per cent.

Although the combined exports of corn, wheat, oats, and flaxseed from Argentina were over 100 per cent greater than the exports from the United States, the average production of these same crops in the United States is approximately 10 times as much as the production in Argentina. This is graphically illustrated in Plate LX, where a comparison is made of the average production, percentage exported, and yields of corn, wheat, oats, and flaxseed for the United States and for Argentina during the years 1911, 1912, and 1913. While the average area devoted to corn, wheat, and oats in the United States is much greater than in Argentina, the area sown to flaxseed in Argentina is practically 50 per cent more than the acreage of flaxseed in the United States. Of the enormous corn production in the United States, which averages nearly 2,850,000,000 bushels, only 1.7 per cent is exported, while Argentina, with an average production of only 246,250,000 bushels, exports 77.1 per cent. The average yield per acre\(^1\) of corn in Argentina for the three years was 27\(\frac{1}{2}\) bushels, against 27 bushels, the average yield in the United States. The percentage of the wheat crop of the United States exported was 17.5 per cent, while Argentina exported 60.6 per cent. Of the oats produced in the United States the averages are computed on the acreage sown and not on the acreage actually harvested, as is the practice in the United States.
States, only 1.1 per cent was available for export, while Argentina had an average surplus of 82.4 per cent of the crop. In the production of flaxseed, Argentina exceeds the United States by over 10,000,000 bushels, although an average of only four one-hundredths of 1 per cent is exported from the United States, while 81.8 per cent of the Argentina crop is available as a surplus. The average yields per acre of flaxseed are the same in both countries, viz, 7\(\frac{1}{2}\) bushels. The exceptionally high percentages of grain available for export are explained by the fact that little or no grain is used in Argentina for the fattening of cattle, as the mild climate permits the stock to graze throughout the entire year, and the small population, approximately 8,500,000, needs comparatively little grain for food purposes.

**LAND DISTRIBUTION AND ITS EFFECT ON AGRICULTURE.**

The manner in which the public lands were first parceled out led to the acquisition of very large tracts by individuals and corporations, and while Argentina may be called a country of immense estates, there is a notable tendency toward smaller holdings. This is especially true in the cereal region and in certain other parts where special cultivations are carried on, such as in the Province of Mendoza, the seat of the wine industry. Land speculation during the past few years has been an important factor in reducing the size of individual holdings. Properties containing more than 12,500 acres are decreasing quite rapidly, although there are many holdings containing a much greater area than this, even in the cereal region.

According to statistics collected by the Department of Agriculture of Argentina, during the crop year 1912–13 there were harvested, from 84,076 farms in the cereal region, 23,571,849 acres of wheat, flaxseed, barley, rye, or millet, an average of 280.4 acres per farm. Of the total number of farms, 32.62 per cent were operated by the owners, while 67.38 per cent were operated by renters. The reasons for such a high percentage of rented farms are many. Perhaps the most important reasons are, first, the difficulty of acquiring small farms at reasonable prices, although it may be said that this is more apparent than real, as many of the
companies and individuals having large tracts are offering land for sale in small farms on reasonably favorable terms. Besides this, there are large tracts of public lands which the Government makes available from time to time. Second, the people who have been attracted to the country are for the most part of two classes—those with little or no capital, who are obliged to begin on rented farms or as “peonés,” or those with plenty of capital, who have acquired large farms. By practicing thrift to a very high degree, some of the former have been able to purchase their own properties. Among the renting class there are many who have sufficient funds to purchase a small farm, but they prefer to employ their capital on large rented farms rather than to farm on a small scale.

The rented farms contain from 125 to 750 acres, and usually form part of a large tract of land owned by an individual or group of individuals. Such ownership may comprise a great number of farms which are leased to “colonists,” the terms of rental being a portion of the crop bagged and delivered at the country stations or a fixed rent in cash. Frequently these properties have formerly been “estancias” (ranches) and have been utilized for stock raising. However, the owners, thinking that larger profits would be derived from cereal growing, have turned agriculturists, subdividing at least a part of their holdings into farms, erecting small huts thereon, and leasing them to tenants. These subdivisions or smaller farms, which are known as “chacras,” are frequently designated by number as a matter of convenience. Many farms have been utilized either for the production of corn, wheat, or flax, as the case may be, for a great many consecutive years. The farmer having no fixity of tenure and the soil being very rich in most parts, there is no incentive for him to practice mixed farming, even though he were permitted to do so. In so many cases that it is possible to generalize, he does not even grow his own vegetables and fruits, but purchases these necessities at the country store, paying for them out of the proceeds from the sale of his share of the harvest when marketed.

Sometimes the landowner will be found actively engaged in agriculture, either by exercising direct supervision over the farming operations or by employing competent farm
Yearbook of the Department of Agriculture.

managers who have direct charge of the work. On such properties as these there is usually available the most modern equipment for farming, and the horses, which, almost without exception, are of the finest types, are kept in the best possible condition (Pl. LXI, fig. 1). The methods employed, although peculiar to Argentina, conform to the conditions of the country and are generally attended with a very high degree of success.

THE PLANTING OF CORN.

Argentina being in the Southern Hemisphere, the seasons are the reverse of those of the United States. Corn planting may be begun in the northern part of the cereal region as early as the month of August. In the central part of the corn belt the planting begins about September 15 and continues until January 1, the principal part of the planting being done between October 1 and December 15, when corn harvesting in the United States is at its height. The extremely long period of time during which corn may be planted is very advantageous to the corn growers of Argentina. Some farmers make a practice of planting at least a part of the crop early, so that replanting may be done a month or two later, if necessary. This is especially true in the region generally attacked by the locusts. These insects invade the northern part of the cereal zone in the spring, flying in immense swarms from their winter breeding grounds in the warmer sections of the north. At times during flight they are so numerous as to give the appearance of clouds and to obscure the sun from view completely. Great quantities of eggs are deposited in the ground, and as soon as the young larvae are hatched they begin their work of destruction to growing crops. The Department of Agriculture of Argentina maintains a large organization for the purpose of fighting these pests, and as the result of their efforts thousands of acres of growing crops are saved annually which otherwise would be destroyed.

Corn is planted very largely by listers and by common planters, most of which are imported from the United States. In fact, 70 per cent of all agricultural implements imported into Argentina are manufactured in the United States. The
THE CEREAL ZONE OF ARGENTINA, COVERING WHEAT, CORN, FLAX, AND OATS.

Each dot represents 1,000 hectares, or approximately 2,500 acres.
The Cereal Zone of Argentina, represented by the Heavy-Shaded Portion, placed in the Corresponding Latitude in the United States.

The light-shaded portion represents the total area of Argentina.
Average Exports of Corn, Wheat, Oats, and Flaxseed of the Principal Surplus-Producing Countries during 1911, 1912, and 1913.
AVERAGE ACREAGE, PRODUCTION, EXPORTS, AND YIELDS OF CORN, WHEAT, OATS, AND FLAXSEED IN THE UNITED STATES AND IN ARGENTINA FOR THE YEARS 1911, 1912, AND 1913.
Fig. 1.—Breaking land for corn on the Estancia La California, Province of Santa Fe.
Note the splendid condition of the horses.

Fig. 2.—Shucking corn.

Fig. 3.—Filling the "Troje" (crib).
FIG. 1.—COMPLETED "TROJES," CONSTRUCTED OF CANE STALKS.
Italian farmer and family are seen in the foreground.

FIG. 2.—"TROJES" CONSTRUCTED OF CORNSTALKS.
Sometimes stalks and husks are used for covering.

FIG. 3.—A GOOD TYPE OF CORN STORAGE CALLED "TINGLADO," PROVINCE OF BUENOS AIRES.
Note the oven in the foreground, situated about 200 feet from the house.
FIG. 1.—Harvesting Wheat with Australian Combined Harvesters and Thrashers.

FIG. 2.—Near View of Australian Combined Harvester and Thrasher.
Fig. 1.—Thrashing wheat from stacks of headed grain.
The straw is being used as fuel.

Fig. 2.—Grain piled on ground on farm prior to being transported to station.
Note the type of cart; also the farmhouse and shed in the background.

Fig. 3.—Rail transportation of grain is effected by means of both flat and box cars.
FIG. 1.—HAULING GRAIN TO RAILROAD STATION.
The roads at times are impassable.

FIG. 2.—TYPE OF WAGON USED IN SOME SECTIONS WHEN THE ROADS ARE GOOD.
Fig. 1.—Receiving and Weighing Grain at a Country Station.

Fig. 2.—Sheds and Warehouses for the Storage of Grain at a Country Station.

Fig. 3.—Grain Piled Along Railroad Tracks at a Country Station Prior to Being Shipped to the Terminal Market.
PLATE LXVII

FIG. 1.—STORING GRAIN OUTSIDE OF WAREHOUSES AT A TERMINAL MARKET TO AWAIT SHIPMENT TO FOREIGN COUNTRIES.

FIG. 2.—LOADING BAGGED GRAIN INTO VESSELS FROM WAREHOUSES AT ROSARIO. The "canaletas" (chutes) and hatchways are covered with canvas during rainy weather.

FIG. 3.—GRAIN ELEVATORS AT BAHIA BLANCA.
FIG. 1.—GRAIN ELEVATORS AT BUENOS AIRES.

FIG. 2.—COUNTRY GRAIN ELEVATOR RECENTLY CONSTRUCTED IN ARGENTINA.

FIG. 3.—AN ELEVATOR AT ROSARIO, SHOWING LABORERS IN THE FOREGROUND STIRRING DAMP GRAIN BY WALKING THROUGH IT.
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corn is planted in rows. In the majority of cases the rows are from 25 to 30 inches apart, but sometimes the distance between the rows is reduced to 20 inches. The hills in the rows are from 12 to 24 inches apart. Cultivation when practiced can be done only one way, as corn is seldom planted in checkrows.

CORN HARVESTING AND STORING.

The time required for corn to mature varies considerably with the different varieties and with the section of the country, but generally from 135 to 160 days must be allowed. The harvesting season may be said to be at its height in April and May. Corn in Argentina is shucked from the standing stalks in the field and thrown into baskets, which the shuckers move from place to place as the work progresses. Each basket, when filled, is carried to some convenient point, where the corn is emptied into sacks (Pl. LXI, fig. 2). A number of these sacks are placed together in the field and are later loaded on a wagon and hauled to the "troje" (crib). The trojes are built by placing poles in the ground in the form of a circle. Wires are then strung around on the inside of the poles to hold the corn or cane stalks of which the walls are constructed, as the filling of the troje progresses. These stalks are usually not fastened to the wires, but are held in place by the corn. One method of filling the trojes is shown in Plate LXI, figure 3. The corn in the sacks as hauled from the field is emptied into a box placed alongside of the wagon. This box, filled with corn, is then drawn up over the top of the troje on a wire cable, where it is dumped into the inclosure. Plate LXII, figure 1, shows a completed troje made from cane stalks. Very frequently a small patch of cane is grown for that purpose. Sometimes the trojes are covered with canvas or zinc sheeting, but usually there is no covering at all unless it be of cornstalks and husks or other similar material, as is illustrated in Plate LXII, figure 2.

In the northern part of the Province of Buenos Aires, where many farmers own the land they cultivate, there is to be found a somewhat better type of crib called "tinglado," which is built in a rectangular form, the sides and ends being constructed of corn or cane stalks, but with a good roof.
of zinc sheeting (Pl. LXII, fig. 3). In a wet season large quantities of maize spoil in the trojes because there is not the proper protection for the grain. During an inspection trip made for the Minister of the Department of Agriculture of Argentina in May and June, 1914, it was found that large quantities of maize stored in uncovered trojes was unfit for market except at very great discounts, it being badly damaged by having molded and fermented, while the maize stored in the tinglados was in very good condition. The average moisture content of the corn in the different types of storage was as follows:

<table>
<thead>
<tr>
<th></th>
<th>Per cent.</th>
</tr>
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<tbody>
<tr>
<td>In trojes without covers</td>
<td>22.0</td>
</tr>
<tr>
<td>In trojes with covers</td>
<td>18.6</td>
</tr>
<tr>
<td>In tinglados</td>
<td>18.1</td>
</tr>
<tr>
<td>In field unshucked</td>
<td>21.1</td>
</tr>
</tbody>
</table>

The weather conditions during 1914 were perhaps as bad as ever experienced in the country, an excessive amount of rain having fallen during the corn-gathering season. The warm climate of Argentina causes the grain to mold very soon, once it becomes damp and wet. The government, however, is carrying on an extensive educational campaign to get the farmers to store their maize in well-covered trojes.

**CLASSES OF CORN.**

Flint corn is grown almost exclusively, although several prominent agriculturists are growing some of the more important varieties of American dent corn, mostly for feeding purposes, with considerable success. The chief objection to the growing of dent corn seems to come from the exporters, who claim that it can not be produced sufficiently dry to carry safely to Europe. While perhaps there is not sufficient evidence that dent corn can be produced to better advantage in Argentina than flint corn, it is believed, according to the best information available, that, with the selection of the best varieties and with the proper care in the handling of the crop, dent corn with a sufficiently low moisture content to carry safely through the Tropics can be raised. It is probable that with the development of the hog-raising industry, which has heretofore been neglected, a greater quantity of dent corn will be produced.
Some of the more common varieties and types of corn grown in Argentina are shown in the frontispiece of this volume, where a comparison is made with Boone County White and Brewer's Yellow Dent corn, grown in the United States. The ears of the flint corn represented in this illustration were secured from a lot of corn placed on exhibition at a rural show held in Argentina. The two ears representing the corn grown in the United States were selected from samples furnished by the Office of Corn Investigations of the United States Department of Agriculture.

The flint corn generally produced may be divided into two kinds, white and yellow. The white is the least grown, and only comparatively small quantities are found in commerce. Of the white corn the type known as "morocho" is mostly grown. The kernels are smooth, flinty, and considerably smaller than the kernels of the white dent corn of the United States. Another type of white corn is known as "perla," the ears and kernels of which are only about half the size of the "morocho." The yellow corn, of which there are several types, is by far the most important in the commerce of Argentina. The variety known as "maíz de harina" is a very starchy corn of a light-yellow color, or, as the name implies, corn for flour. The ears and kernels are larger than those of the true flint corns. This variety is grown only in small quantities in the extreme northern part of the grain belt, is used chiefly for making meal, and is consumed locally, little or none being found in commerce. The most common varieties of yellow corn are "Canario," "Húngaro," "Cuarentón," "Lombardo," and "Piamontés." These varieties constitute by far the greatest part of the corn exported. The "maíz polenta" is a Piedmontese variety and takes its name from polenta, a kind of mush or porridge which is eaten extensively by the Italians. After a few years this variety degenerates, losing its original red color and becomes nearly yellow. The "maíz cuarentón," the kernels of which are very small and flat, presents a very fine appearance, especially when shelled, and frequently commands a premium over the ordinary yellow corn in some foreign markets in that the small kernels make it especially desirable for poultry and pigeon food.
THE SEEDING OF WHEAT, OATS, AND FLAX.

Wheat is sown as early as May 15 and as late as September 15. The greatest quantity is seeded during July and August, which is the middle of the Argentine winter. In the center of the wheat belt the harvest begins usually in December, depending on the time of sowing and on the weather conditions prevailing throughout the growing season. During the crop year of 1914-15 the harvest did not begin until January, and in some parts not until February. This, however, was an exceptionally late season.

The flaxseed grown in the northern part of the cereal zone is usually harvested a little earlier than the main part of the oats or wheat crops. The harvesting of oats takes place at about the same period as wheat, the seeding being done in May, June, July, and August.

HARVESTING AND THRASHING.

The harvesting of wheat is accomplished by means of headers, binders, and Australian combined harvesters and thrashers. The latter are sometimes called “stripper harvesters” from the fact that the heads are stripped from the stalks without cutting the plants. The machine is equipped with a comb having fingers which are set just far enough apart to permit the plants to be drawn through until the heads are reached, at which time the latter are stripped from the straw by the aid of beaters revolving within a drum situated above the rear of the comb. While passing through the machine the wheat is separated from the heads, cleaned, and finally deposited in a box having a capacity of several bushels, which is attached to the machine. From this box the wheat is sacked and left at convenient points in the field. Some machines are equipped for sacking the grain as it is thrashed, the bags being deposited in the field as they are filled. From 6 to 8 horses are generally used to draw the machine, and the operation may, under favorable conditions, be accomplished by one man, although at times an additional man or boy is required to assist in driving the horses. Where several machines are employed in one field, an extra man or two is required for sewing and piling the
bags of grain. While there are many disadvantages connected with the use of the "stripper harvester," the great rapidity with which the work is done and the saving in cost of labor in gathering the crop are greatly in its favor when the conditions are right for its use. The essentials for the successful operation of this type of harvester are that the land should be reasonably level, the crop standing up well in the field, and the grain thoroughly ripe and dry. As soon as the crop reaches the proper stage there is a necessity of completing the harvest as quickly as possible in order to prevent excessive loss due to the shattering of the grain. An illustration of this type of harvester is shown in Plate LXIII, figures 1 and 2. Grain harvested with a binder is usually thrashed from the shocks. Headed grain is stacked, generally without any covering (Pl. LXIV, fig. 1). Much damage is sometimes done to the grain in stacks. This was the case in 1915, when it was practically impossible to move the thrashing outfits, due to the extremely bad condition of the roads, so that much of the grain remained in the fields for several months before thrashing. According to the Department of Agriculture of Argentina, there were many stacks unthrashed on May 26, a very unusual occurrence, as generally the thrashing is completed by the last of February.

CLASSES, VARIETIES, AND TYPES OF WHEAT.

Although the wheats of Argentina are generally classed as soft wheats they more nearly resemble our varieties of hard red winter. The principal varieties are Barletta, Ruso, Italiano, Frances, Rieti, Tuzela, and Saldomé. These varieties have been grown for many years, and it is an unfortunate fact that very little attention has been paid to the selection of seed wheat, so that the wheats have become very badly mixed, it being almost impossible to find pure types. Barletta is practically the only variety recognized in commerce, the others being shipped simply as wheat or "trigo de pan," which means wheat for bread. The "Bolsa" of Rosario has designated a special type of wheat, as "Rosafé," which is simply a commercial name given to the better wheats grown in the Rosario district and sold to Europe under that name. A number of varieties have been mixed and grown together in certain sections and erroneously called "Híbrido"
(hybrid). The cultivation of this wheat has increased quite rapidly, some agriculturists believing that they had a new variety. This wheat is also called "Pampa," from the fact that it is grown extensively in the Territory of La Pampa Central. Another variety grown only in small quantities, mainly in the northern part of the cereal zone and in the Province of San Juan, is known as "Candeal." This wheat, while probably a durum, more nearly resembles the wheats known commercially in the United States as Wild Goose wheat. The Candeal wheat is used almost exclusively in the manufacture of edible pastes, and very little of this class of wheat ever reaches the export markets.

MARKETING.

After shelling or thrashing, the grain is placed in bags and hauled directly to the railroad station, or it may be piled on the ground to await such transportation (Pl. LXIV, fig. 2). Many farmers do not haul their own grain to market, but hire regular teamsters to perform this service for a certain price per 100 kilos (220.5 pounds), the cost varying according to the length of haul and the condition of the roads. The prevailing tariff for hauling wheat is from 1 1/2 cents to 5 1/2 cents per bushel for each league. Generally, the grain is transported to market in carts and wagons having immense wheels and drawn by horses or oxen. Anywhere from 8 to 16 horses are hitched to one wagon, pulling from every available place where a hook or ring may be fastened. This type of wagon is said to be necessary, owing to the frequently bad condition of the roads (Pl. LXV, fig. 1). During the periods of dry weather the roads usually become fairly good, and in such cases it is possible to use a wagon with smaller wheels. Such a wagon is shown in Plate LXV, figure 2.

On arrival at the station, the grain is weighed on a small platform scale and inspected and received by the local buyer, after which it is stored in a warehouse or shed or piled alongside the railroad tracks to await shipment to the terminal market (Pl. LXVI, figs. 1, 2, and 3).

The only means of drying damp grain which has begun to show signs of deterioration is to spread it out on the floor of the warehouse or on a canvas placed on the ground out-
side the warehouse, as commercial grain driers are not yet available.

In transporting grain from country stations to the export markets both box cars and flat cars are utilized. The latter when loaded with grain are covered with tarpaulins, as shown in Plate LXIV, figure 3. Very little grain in Argentina is hauled by rail for a distance greater than 300 miles. The freight tariffs for hauling grain on the railroads are based on the metric ton of 2,205 pounds. The information given in the table herewith will give an idea of the rates in force in 1914 on one of the principal lines which traverses the corn belt extensively.

*Examples of railroad freight rates on corn in Argentina.*

<table>
<thead>
<tr>
<th>Approximate distance from shipping point to port in Miles.</th>
<th>Rate in cents (U. S.) per 100 pounds.</th>
<th>Approximate distance from shipping point to port in Miles.</th>
<th>Rate in cents (U. S.) per 100 pounds.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>3.87</td>
<td>252</td>
<td>13.26</td>
</tr>
<tr>
<td>48</td>
<td>5.90</td>
<td>305</td>
<td>14.65</td>
</tr>
<tr>
<td>98</td>
<td>8.52</td>
<td>355</td>
<td>15.42</td>
</tr>
<tr>
<td>127</td>
<td>9.98</td>
<td>403</td>
<td>16.17</td>
</tr>
<tr>
<td>148</td>
<td>10.52</td>
<td>470</td>
<td>17.35</td>
</tr>
<tr>
<td>174</td>
<td>11.22</td>
<td>502</td>
<td>17.87</td>
</tr>
<tr>
<td>200</td>
<td>11.87</td>
<td>575</td>
<td>19.01</td>
</tr>
</tbody>
</table>

Grain received at the export market may be loaded directly aboard ship by means of electric elevators leading from the car door to the hatchway or carried aboard by “peones” (laborers). If the grain is to be shipped in bulk, the bags are opened at the hatchway. If shipment is not made immediately, the grain is taken from the cars and stored in warehouses or piled outside (Pl. LXVII, fig. 1). At many places on the River Parana, where the banks are high above the water, the loading is done by means of “canaletas” (chutes), leading from the warehouses to the ship’s deck. During rainy or damp weather the chutes and hatchways are covered with canvas to prevent the bags from becoming wet (Pl. LXVII, fig. 2).

**GRAIN STORAGE FACILITIES.**

While there are a few terminal grain elevators located at Rosario, Buenos Aires, and Bahia Blanca, only a comparatively small amount of grain is handled through this
type of storage except at Bahia Blanca (Pl. LXVII, fig. 3), where the capacity of the elevators is much greater than at Rosario or at Buenos Aires (Pl. LXVIII, fig. 1). The elevator storage capacity for the whole country, all of which is located in the ports, possibly would not exceed 8,000,000 bushels. The total grain storage available, including sheds and warehouses throughout the country, is approximately 211,000,000 bushels, of which 16,800,000 is located at the export points.

A number of projects for the construction of country and terminal elevators have been discussed. Recently a project was submitted to the National Congress, which calls for the construction of a system of public elevators. At the present time there are possibly not more than three or four country elevators in the whole of the grain belt (Pl. LXVIII, fig. 2), and these have been built only within the past few years. This is a question of great importance to the Argentine producer, as without elevators no facilities are available for the proper cleaning of grain or for the conditioning and handling of damp or deteriorated grain. The heavy discounts assessed against damp grain are largely due to the costly and impracticable method of drying by spreading the grain out on the ground (Pl. LXVIII, fig. 3). It would be impossible to give an accurate statement of the losses to the producers caused by the system of handling grain in bags instead of the bulk system, as employed in the United States and Canada. That the bag system is expensive is fully realized when it is considered that the sacks alone cost the producer from 12 to 15 cents each, and to this must be added the cost of handling, which is necessarily greater than if handled through elevators in bulk.

CLASSIFICATION, INSPECTION, AND GRAIN CONTRACTS.

In Argentina there is no system of grading grain such as is known in the United States. Practically all of the export grain is handled by five or six large export firms, some of which have their agents in the principal grain-shipping stations, who buy direct from farmers, local dealers, and commission merchants.

The "Cámara Gremial de Cereales" of the commercial organization of Buenos Aires known as the "Bolsa de Com-
Production and Handling of Grain in Argentina.

"Mercion" has formulated a contract for the use of its members in the buying and selling of grain. According to the general rules governing this contract, wheat is bought and sold to be sound, dry, and clean; to have a certain specific weight, the standard being 80 kilos per hectoliter, or approximately 62.2 pounds per Winchester bushel. Deliveries may be made of wheat weighing 5 pounds less than standard or other specified weight, with corresponding discounts. Likewise, a premium is given if the wheat weighs more than that specified in the contract.

Flaxseed sales and purchases are made on the basis of 4 per cent foreign material, with a tolerance up to 8 per cent. The Cámara Gremial makes up a monthly average of the samples received, which forms the basis of quality.

Oats are sold on the basis of average quality, with an allowance of 6 per cent of black oats, 3 per cent of foreign material and 3 per cent of barley being considered as the basis for foreign material, other grains, etc. Oats containing a maximum of 5 per cent of foreign material, 5 per cent of barley, and 10 per cent of black oats are deliverable, with corresponding discounts. When the specific weight is declared in the contract, a maximum tolerance, equivalent to approximately 3.1 pounds per bushel, is allowed, with corresponding discounts. The usual standard for specific weight is equivalent to 36⅓ pounds per Winchester bushel.

Maize is sold on the basis of the terms sound, dry, and clean, and in practice the following additional classifications are usually made:

1. Sound, dry, and clean, according to season.
2. "Fresco," i.e., damp maize, but cool. The usual discount is 7 cents per bushel.
3. "Tale Quale" includes corn which may be very damp, but free of heat and badly mold-damaged grains. The usual discount is 10½ cents per bushel.

Grain is sold to Europe chiefly on the La Plata rye terms contract, which provides that the seller shall guarantee the condition of the grain on arrival in Europe. Differences arising out of the contract are arbitrated in Europe, usually in London. Another form of La Plata contract is known as the "Tale Quale contract," which stipulates that shipment must be made in good condition but "tale quale" as regards
condition on arrival. The quality of the grain shipped on either contract must be a fair average of the season's shipments or in accordance with sealed samples, taken at the time and place of shipment.

WAREHOUSE CERTIFICATES.

In October, 1914, a national law, known as the law of warrants and certificates of deposit, was enacted. By the provisions of this law certificates of deposit and warrants may be issued by duly authorized warehousemen, provided that they have previously conformed to certain specified conditions as established by the Government for the grain which they have taken in store. Such certificates of deposits and warrants are negotiable and may be discounted at the banks or by the concerns issuing the certificates. This law, which applies to practically all products which are stored, promises to be of immense benefit in the commercial handling of grain.