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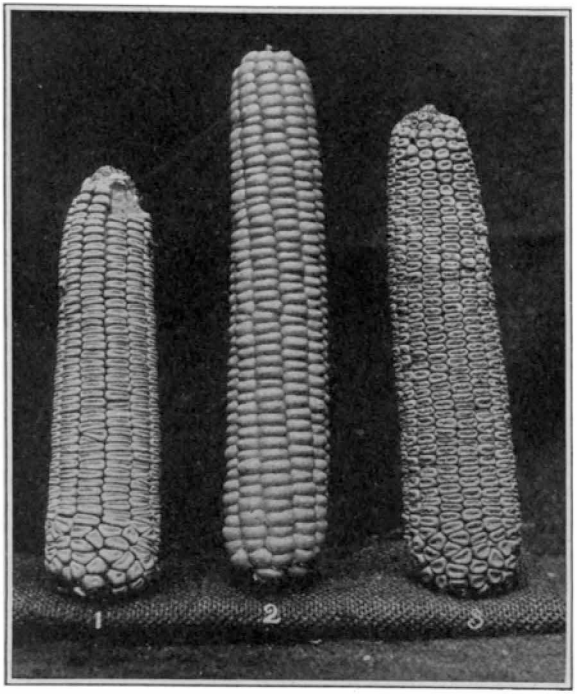
CORN GROWING IN COLORADO

By ALVIN KEZER
Head of Department of Agronomy
and G. S. RAY
Specialist in Agronomy



1. Swadley Dent. 2. White Flint. 3. Yellow Dent

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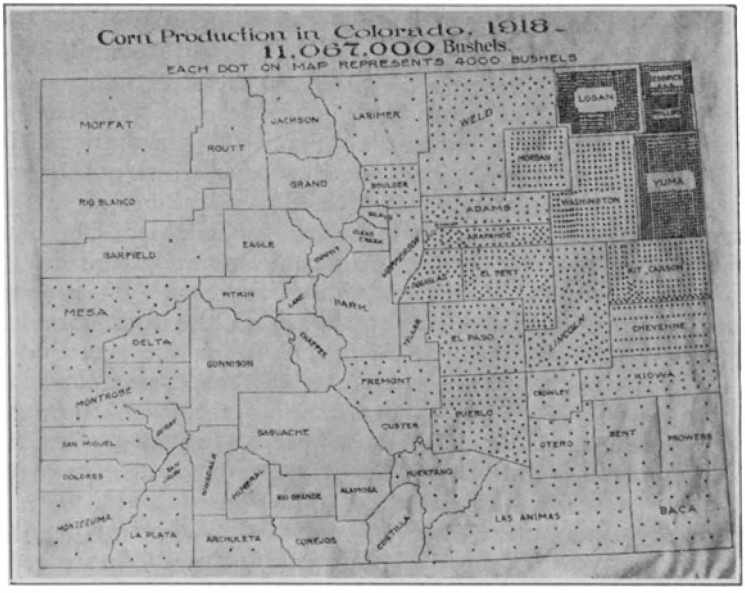
CORN GROWING IN COLORADO

By ALVIN KEZER
Head of the Department of Agronomy
and G. S. RAY
Specialist In Agronomy

Corn has never been considered an important crop in Colorado. The total yields have increased so rapidly, however, that it is now recognized as one of the important crops of the State. In spite of its importance, it has not received the attention that it should from those interested in the promotion of Colorado agriculture.

Colorado has never been considered in the corn belt, yet its corn acreage has been steadily increasing. This is well illustrated when we consider that in 1909 the acreage was 326,559, while in 1915 it had grown until, in round numbers, it amounted to 470,000 acres, and that by 1918 had increased to 527,000 acres.

If we make a comparison of corn yields in Colorado with those of the corn belt, Colorado will not seriously suffer from the comparison. Taking a ten-year average, 1908-1917, as reported by the Bureau of Statistics of the United States Department of Agriculture, we find that the average yield has been 19.7 bushels



to the acre. During the very dry year of 1911, the average yield per acre was 14 bushels. During the dry year of 1913, which was nearly as severe as the dry year of 1911, the average yield was 15 bushels per acre. In 1915, which was a very wet year, the average yield was 24 bushels per acre, while in 1918, a normal year, 21 bushels was the average yield.

The total annual corn production in Colorado in 1918 was, in round numbers, 11,067,000 bushels. When we compare these yields with wheat, which has long been considered one of our most important crops, we see the comparison is very favorable to corn. In 1918 the winter wheat acreage of Colorado was about 430,000, yielding an average of 16.5 bushels per acre, making 7,095,000 bushels. During the same year, the spring wheat acreage amounted to 312,000, yielding at the rate of 20 bushels per acre, or a total of 6,240,000 bushels. If we take the total of both spring and winter wheat, we find that the grand total wheat yield in Colorado in 1918 amounted to 13,335,000 bushels, only about 2,250,000 in excess of the 1918 corn production. Manifestly, with corn yielding a total number of bushels so nearly the same as wheat, it must receive greater consideration.

CORN AS A GRAIN CROP

When we consider corn as a Colorado crop, we cannot lose sight of the great diversity of conditions in Colorado. About two-thirds of Colorado is made up of mountains, mountain valleys, plateaus and mesas; nearly one-third is occupied by the plains, which extend from the foothills of the Rocky Mountains to the eastern boundary. The lowest altitude in the state is nearly 3,500 feet, at a point on the eastern boundary where the Arkansas river flows from Colorado into Kansas. From this minimum altitude of 3,500 feet, the altitude rises until at numerous points in the mountains it reaches above 14,000 feet. As a result of this wide diversity of altitude, the climate is highly variable. The natural habitat of corn is a region of considerable moisture, hot days and not over-cool nights. While hot days are abundant in certain sections of Colorado, especially on the plains, the nights are nearly always cool. Consequently, corn never attains the size that prevails in the corn belt. As a consequence of the altitude, the seasons in all parts of Colorado are short, running not over 150 days between frosts in localities of greatest heat. At many points on the plains the season is not over 90 days free from frost. As a result of this short season, corn for the production of grain, to be successful in Colorado, must be able to mature in a short growing season. Practically all of the Colorado plains are successfully producing corn as a forage crop.

Good Type of Dry Land Corn

The localities on the plains where corn is more successful as a grain crop are the sections about Haxtun, Fleming, Paoli and Holyoke in northeastern Colorado; about Wray in eastern Colorado, and along the Arkansas Valley. Certain sections of the divide region are also successfully producing corn as a grain. Corn as a grain in the mountainous regions is limited to the lower and hotter river valleys and mesas which are favorably located as to the slopes so as to give a long season, comparatively speaking, free from frosts and a rather high daily temperature. Such conditions are usually found at altitudes below 5,000 feet. This same statement may be applied also to the plains. There will, however, be found limited localities where corn may be grown successfully for grain at somewhat higher altitudes than this. Such localities, however, are favorably situated, with favorable slopes, topography, air drainage and other features that tend to give the altitude a warmer

climate and a somewhat longer growing season than their elevations would indicate. Corn as a dry-land crop on the plains, and in the mountain valleys, is seldom grown successfully where the normal rainfall is less than 15 inches. In other words, the lower limit of rainfall, where successful production ceases is about a normal of 15 inches. The amount of rainfall required to produce a corn crop varies in the manner with which the precipitation falls. Where the precipitation practically all comes during the growing season, the conditions are most favorable for high production on a light rainfall.

Parsons' High Altitude Corn grows very short in the high altitudes but it produces the ear

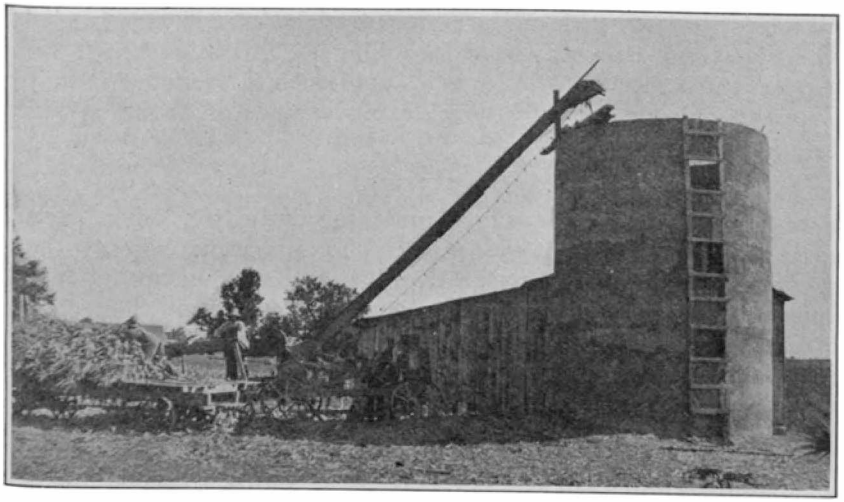
With a good water right, corn under irrigation may be grown wherever the season is sufficiently long. In the Arkansas Valley, especially under irrigation, corn has steadily increased in favor as a cultivated grain crop. The grain is both fed and sold. The season in this valley is not only hotter but is longer, making the climate much better adapted for high grain production. There

are other irrigated sections of the State and many mountain valleys and mesas where corn may be successfully grown as a grain.

A great deal of corn is shipped into Colorado yearly from Kansas, Nebraska, and Iowa points for feeding purposes. We are still able to produce a great deal more grain and consume the same in Colorado. Since it is a grain that can be produced profitably, it should be more generally grown. It will increase our agricultural prosperity by making the corn grower a good income and enable our feeding industries to obtain corn with greater certainty than can be done from a distance.

CORN AS A FORAGE CROP

As a forage crop, corn may be produced up to elevations of about 7,000 feet. In limited localities favored by slope, shelter, and topography, forage corn may be produced at altitudes as high as 8,000 feet. In all of the northeast plains, in that section of Colorado lying north of a line through Colorado Springs, corn is probably the best annual forage crop to be found. Not only is this true because corn is well adapted to the region itself, with its summer rainfall, but also, because of the fact that it produces a very large amount of feed which is easy to harvest, is of high food value, and is relished by live stock. In the past the standard method of saving corn for forage purposes was to cut the crop as fodder or as corn stover. The tendency, however, at present is to increase the use of silos for storing the crop. This will insure feed for stock from one season to the next.



Utilizing the entire corn crop

The silo saves from 90 to 95 per cent of the total feed value of the crop. When corn is cut for fodder it dries in the field. The waste or loss from weathering, mechanical loss, and reduced palatability sometimes amounts to as little as 35 per cent, and sometimes rises to as much as 80 per cent. Usually not over 20 per cent of the food value produced on the land actually reaches the animals which are fed on dry fodder therefrom. The silo absolutely shuts off this loss, and enables the food value to be almost completely saved. It also puts the forage in a highly palatable condition. The use of corn as a forage crop with a silo, will make it possible to very much decrease the pasture area on the dry land. It will make more certain the live stock industry, especially the dairy industry, in irrigated regions where corn is made a part of the crop rotation even if it occupies the part of a forage, and not a grain, crop. Corn as a forage crop usually produces from 10 to 20 tons of silage per acre from irrigated regions, and from 2 to 8 tons of silage per acre from dry-land regions.

The use of corn as a forage crop often goes hand in hand with the production of grain. Frequently the best market for a great proportion of the crop will be as silage utilized by live stock. Even where a portion of the crop is marketed as grain, a great deal may be utilized as silage. Owing to the fact that corn may be used as a forage in elevations considerably above that which is possible for the growth of corn as grain, it materially increases the live stock, especially the dairy possibilities, of many of our mountain valleys and a large proportion of our high plains.

There is absolutely no doubt that the carrying capacity of dry-land farms for live stock can be materially increased if corn is used as a forage crop and converted into silage. This siloed corn can be successfully used not only as a supplemental feed but it may be used to keep up the milk flow during periods of drouth which cause short pastures.

CORN SOIL

In Colorado the soils which most successfully produce corn are sandy loams and light sandy soils. This is in part due to the fact that such soils are warmer than silt and clay loams. Being warmer, they permit planting earlier in the spring. The crop develops more rapidly and matures earlier in the fall. The best corn districts of the plains are almost without exception on sandy land or sandy loam. In only a few localities is corn successfully grown on other types of land and these few localities are located in the hotter portions of the State.

A light, sandy soil will not only catch rainfall better, but it will give water up more readily to growing plants. In the corn-

growing sections of Colorado the light soils are quite uniformly planted to corn, while the so-called hard lands are very largely planted to wheat. This is not mere caprice but is the result of very hard, bitter experience. Light or sandy soils will more nearly insure a crop of grain because they are very much warmer. Heavy soils may be described as those made up of finer or smaller particles than sand. They are too cold and delay the maturity of the crop too long to make good corn soils. As we go southward in the State, or reach lower altitudes along the Arkansas Valley, it is possible to utilize lands very much heavier in texture than is possible toward the mountains where the altitude is high, or in the northern part of the State, where the altitude is relatively high and the latitude greater.

ROTATIONS FOR CORN

Altho corn is an important crop, it is exceedingly important, if it is to be successfully grown thru a long period of years, that the lands be rotated. There are several reasons for this. First, different crops affect soils in a different manner. Second, insects and disease become abundant and troublesome where corn is grown continuously on the same land. Third, rotations destroy the disease and insect enemies, improve tilth and make possible the restoration or even increase of productivity. Rotations, therefore, are important not only to keep up the fertility, to keep up the best water relations in the soil, but also, to keep down the enemies of the crop. These increase enormously where corn is grown continually on the same land.

Any rotation planned for corn should include a legume. For this purpose, in irrigated regions, alfalfa may be used in much the same manner as it is used with other crops. Of course, in irrigated regions, there are a number of leguminous crops which can be used; alfalfa, field peas, sweet clover, and even red clover. However, it is scarcely necessary to use any other rotation crop than alfalfa, as it is so easily grown, and is so successful and profitable.

On the dry lands, however, the number of leguminous crops which may appear in the rotation is small. Alfalfa in rows is a possibility, altho at present it only is recommended with qualifications. Sweet clover may be sown with success nearly everywhere on the plains and in many mountainous regions where irrigation is precarious and corn a possibility. The leguminous crops then, which may be used are, possibly alfalfa, sweet clover, field peas in certain regions, and beans in others. These leguminous crops, with small grains, combine in very nice rotations with corn. Not only do they permit the keeping up of best water relations in

the soil on the dry land, but they permit the maintenance of a proper balance of soil constitutents. A diversity of crops more nearly insures successful agriculture in the dry-land regions.

MANURE

Corn is rather a gross feeder and as a consequence can take manure rather more heavily without injury to the crop and without serious danger of lodging than can the small grains. In irrigated sections corn may be manured very heavily, especially if the water right is good, without the least danger to the development of the crop. The crop is almost sure to obtain more benefit the second year from an application of unrotted manure. Thus it is better practice if corn is to occupy the land for two years, to apply manure with a light dressing this year, and next year apply a light dressing also. The manure may be applied, after which it should be pulverized and worked into the top soil by means of the disk harrow. Or, it may be applied as a top dressing even after the corn is up. The only difficulty is that it sometimes interferes with cultivation.

On the dry lands, manure must be applied very much more judiciously than under irrigation. Owing to the fact that any application of manure may disturb the water relation at the surface, it is a very dangerous practice to manure corn heavily under dry-farming conditions. Where heavy applications of manure are put on, there is grave danger of firing the crop. This firing process is nothing more or less than a shortage of water due to the excessive amount of unrotted organic matter present. Consequently the best practice of manuring on the dry lands is to make very light applications. Manure should be spread very thinly and evenly. It should be well pulverized and mixed with the soil by means of the disk before it is plowed under. If this is done, practically all danger of firing due to excessive organic matter at the surface of the soil will be obviated. If the manure is well rotted, light applications may be given. But it is not so necessary with well rotted manure to pulverize the same and mix with the surface soil, altho the soil responds readily to this treatment with well rotted manure.

There are very few farms which produce sufficient manure to keep up the supply of organic matter in the soil. In such cases it is a good practice to use some crop in rotation, preferably a leguminous crop, which can be plowed under as a green manure.

In irrigated sections the supply of organic matter may be maintained by rotation with alfalfa. In the dry sections, however, alfalfa is very seldom feasible; but in many sections it is feasible to rotate corn with sweet clover as a green manure crop.

The nature of Colorado soils is such that organic matter is frequently a limiting factor in production. This is as true for the corn crop as for other crops. It is much better agricultural practice to recognize this principle and commence to use stable manures or green manures on both irrigated and dry land before such treatment is absolutely necessary. As the chief function of manure on our soils is to keep up the supply of organic matter, it is highly desirable to practice deep plowing. At least one plowing of the rotation system should be deep. This is due to the fact that deep plowing helps to deeply incorporate organic matter in the surface soil, thus improving its productivity and water relations.

PREPARATION OF THE SEED BED

Preparation of Seed Bed for Dry Farming.—In dry-farming sections, it is necessary to give a great deal more attention to the preparation of the seed bed than it is under irrigation conditions. Consequently, more attention will be given at this point than will be devoted to the preparation of a seed bed for corn under irrigation. Since the preparation of the seed bed is of necessity a part of the rotation system, one successful method of preparation is described which includes a part of a rotation system. The system suggested may be followed on the lighter lands, such as sandy loams, sandy silts, and sands.

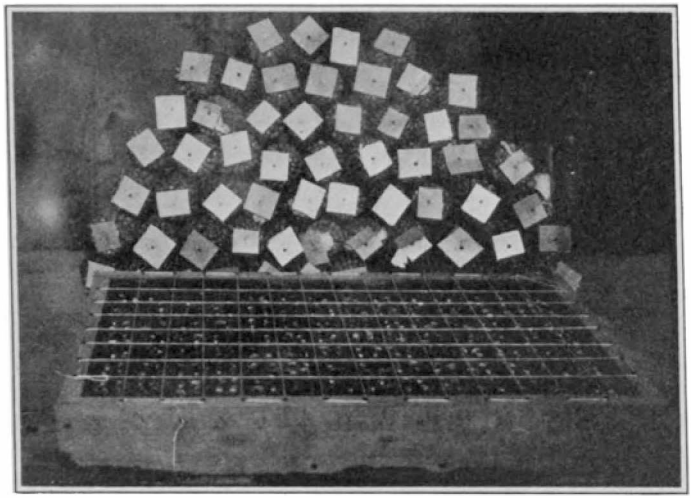
For these lighter soils, the suggested method, if religiously followed out, keeps down weeds, conserves moisture at a great reduction of labor and still makes it possible to keep up the yielding capacity of the soil, if consistently carried out. It is practically as follows: If we start the system of rotation with summer tillage, the first crop put in after summer tillage will be winter wheat. Immediately after harvest the land is double disked for the double purpose of killing all weeds which spring up, and puting spring the land is double disked early. Then corn or some other cultivated crop is planted. Following corn small grain is planted. The small grain stubble may be disked immediately after harvest to destroy weeds and conserve moisture and then plowed the following spring for the summer tillage. The disking in the fall is sometimes omitted.

In this method of preparing the seed bed for corn, corn always follows small grain, usually winter wheat. The seed bed is not plowed for corn, but is prepared by disking and harrowing. For many of the heavier lands, especially if there is sufficient moisture in the soil, fall plowing is desirable. But fall plowing may not be practical on all lands, as most of the lighter soils will blow so badly in our ordinary winter climate that is is not advisable to fall plow. Such lands, however, may be listed immediately after

harvest. The listed furrows prevent the soil from blowing severely, and leave the land in excellent shape to catch snow and take up rainfall, at the same time keeping down weeds. In the spring the middles are broken out and the planting is either done in the listed furrows or the ground is leveled by working down with cultivators, or disk and harrow.

In some locations a seed bed may be prepared for corn by listing. Listing is not the best practice in the greater portions of Colorado corn-producing sections. Listing tends to lengthen the time required to develop corn to full maturity. The season in most localities falls too short under the best conditions, so that any shortening by soil preparation endangers the crop. Consequently, surface planting should be resorted to nearly everywhere. In nearly all sections of the State the seed bed for corn, whether plowed, listed and middle broken, and afterwards leveled, or whether it is prepared by disking small grain land which was previously plowed, should be compact below the surface and well pulverized at the surface. Of course, preferably, the seed bed should have sufficient water to germinate the crop and start it well on its way. This is especially true of dry land.

Preparation of Seed Bed for Irrigated Districts.—On heavier land in irrigated districts, if the previous crop permits, the land should be fall plowed and worked down in the spring to a well compacted seed bed pulverized at the surface. If the previous crop



Method of making germination test in soil. Ears numbered to correspond to numbers of squares

does not permit of fall plowing, the land should be plowed in the spring as early as possible. The longer the plowing is done before planting, the better. Plowing immediately before planting should be relatively shallow, as there is not time for nature to properly pack the seed bed. In the irrigated sections, land should nearly always be plowed, because there is a tendency under irrigation to pack the soil and form a more or less surface crust. Proper cultivation, stirring or plowing, largely overcomes this tendency in the soil. Land that has previously been in some kind of intensely cultivated crop, such as potatoes, or occasionally sugar beets, may be planted by disking, leveling, and possibly harrowing. The seed bed under irrigated conditions should always be left level prior to planting. This should be done to facilitate later irrigation and to shorten the growing season of corn, which is lengthened by the very process of irrigation.

PLANTING

Seed Treatment.—The only seed treatment which may be given corn with any hope of success is to have the seed properly selected and dry. A great many ask the question, "Can we not treat seed corn in much the same manner as wheat seed is treated to prevent smut?" This question must be answered in the negative for corn. There is no known seed treatment which will prevent smut in corn. Growing corn may be infected with the smut disease even after the corn is at considerable height, perhaps when 3 feet high, or even later. It is for this reason that seed treatment to prevent smut in corn is not successful. Seemingly the only way to prevent smut in corn is to regulate the growing conditions so that the corn grows vigorously from the starting of the seed to maturity, and to practice a rotation with other crops so that the land will be kept free from smut, thus reducing the source of smut infection. A rotation increases fertility, thus improving growing conditions.

Planting Corn on Dry Land.—The time for planting corn on the dry land varies somewhat from the north to south and also in different sections. However, it is not advisable to plant corn until all danger of killing frost is over, or at least not to plant corn until within a few days of the last periods of killing frosts. In the northern Colorado sections this will be around the middle of May. In the southeastern part of Colorado, corn may be planted usually by the 10th of May, as the last date of killing frost is about May 15th. There is little danger that corn put in as late as the 10th of May will be up and started before this time.

Under dry-land conditions, water in the soil is always a limiting factor in production. Consequently, the corn grower must

calculate on this factor and reduce the number of plants per acre, which is done in two ways. First, by drilling corn so that there will be one stalk in a place; and second, by decreasing the rate of planting so that there will be fewer stalks per acre. In most sections corn can be planted in rows 3½ feet apart, and in drills in the rows 18 to 24 inches apart. In the dryer sections the rate of planting may contain fewer plants than this.

Some sections where corn may be produced are so dry that the rows may be 7 feet apart and the rate of planting in the row one stalk every 2 feet. This 7-foot system is used both with surface planting and listing. Some are doing ordinary listing but only planting every other listed row. In other instances the listed rows are 7 feet apart. Yields of corn have been very satisfactory under this system of planting. It more nearly approaches regular summer fallowing than the other system of planting. This corn ground, if properly cultivated and kept free from weeds, will be in excellent condition for winter wheat.

Planting Corn Under Irrigation.—Under irrigation, the water supply is usually amply sufficient to grow maximum yields of corn if it is judicially used. Consequently, the rate of planting should be much greater than is true under dry-farming conditions. Time of planting may be the same as in similar localities. Corn under irrigation may be planted preferably in drills, in rows 3½ feet apart. The rate of drilling should be about one stalk every 12 or 15 inches, unless the corn is grown for forage, when it may be one stalk every 8 inches. Under irrigation, corn may be planted by means of a check rower. Where this is done about three kernels per hill is the correct amount to plant.

CULTIVATION

Corn Cultivation Under Dry Farming.—In the dry-farming districts, the greater portion of corn cultivation should be done in the preparation of the seed bed. Cultivation after the corn is up must vary according to seasonal and planting conditions. If listed, the first cultivation should be done with some of the various listed corn devices. Later the cultivation can preferably be done with a shovel cultivator. It is better to use one with many shovels, to thoroly stir the surface, thus keeping down weeds and preventing the formation of a crust, than it is to use a cultivator having a small number of large shovels which would stir the soil very deeply. Cultivation should aim to keep down all weeds. If this purpose is accomplished by the stirring of the surface to 3 or 4 inches, all the ends of cultivation will be met. Deeper cultivation than this is unnecessary and costly, as it takes horse power and

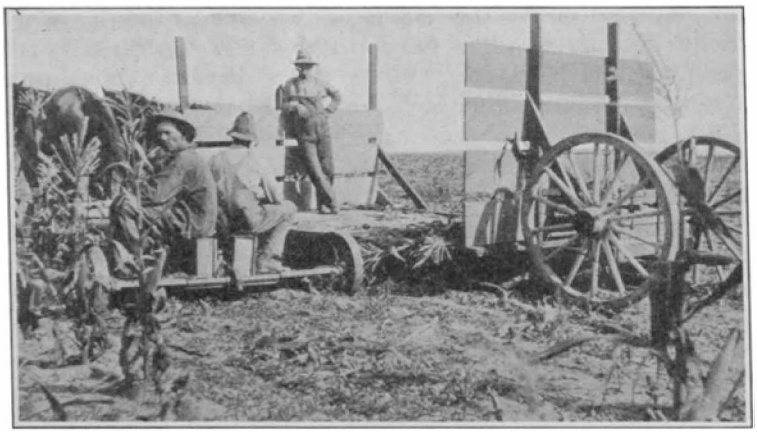
it produces no beneficial results on the corn crop. If the rain should come after the corn is too large to cultivate with a large cultivator, it may be cultivated to keep down weeds by means of specially devised harrows pulled by a single horse. Often a small boy may ride the horse, thus making the operation easier.

Cultivation of Corn Under Irrigation.—The first cultivation may be simply a harrowing, or it may be a light cultivation with a many-shoveled cultivator to keep down weed growth. Corn in its young growth requires very little water. In most northern Colorado sections, therefore, one or two cultivations may usually be given before irrigation is required. In many sections of the State, however, irrigation will have to commence at once. Irrigation should be given just as quickly as the corn crop needs water. Later irrigation should be given just as frequently as the crop shows need of water. When corn is first started, when it first commences to joint, and when the silk and tassel are forming, are extremely critical periods for corn in its demands for water. Great pains should be taken to see that irrigation is given at these periods, or at least that the corn is provided with water. Of course, if the soil is moist, irrigation should be withheld. In preparing corn land for irrigation, a furrow opener, similar to that used for beets, should be used, as corn is irrigated by the furrow method. This pre-supposes, of course, that the rows are placed on the land so as to make proper land slope for irrigation. Just as soon as the soil will permit, after irrigation, corn should be cultivated. This cultivation should be given in every case up until the corn has grown large enough to thoroly shade the ground. After which cultivation following irrigation is not so important, but it will be of benefit even here. It is doubtful, however, if the benefit will be great enough to justify the cost which the cultivation incurs.

HARVESTING

Silage.—Corn may be harvested for silage whether on dry land or under irrigation. Silage corn should be allowed to grow as late as the season permits, or until the corn is practically matured, i. e., the kernel has become hard and dented. The stalk is usually somewhat green as late as this stage. Many experiments have been conducted which show that a greater amount of feed of a better quality and that will keep more easily can be obtained from silage which is made from corn cut at this stage of maturity. If any very large acreage is to be cut for silage, it can be most easily done by using the corn binder. However, a very good tool may be made by providacreage is to be cut for silage, it can be easiest done by using the corn binder. However, a very good tool may be made by providing a sled having heavy knives set at an angle on the front edge.

This sled is drawn by a horse, the corn is grasped by a man riding upon the sled and is thrown back upon the sled as the knives cut it off near the ground. The loads thus obtained are taken off in the arms and put onto a silage-hauling rack. This method, while more laborious than the corn binder method, is very rapid and saves practically all of the feed.



Home-made harvester saving all the crop in the high altitude of El Paso county (Photo by Lauck)

Fodder Corn.—Corn for fodder should be cut at the same time as for silage, and placed in large round shocks, well tied at the top. Corn fodder is a good reliable dry feed, but is wasteful. Experiments have abundantly shown that the most economical way of preserving the greatest food value of corn is to silo it for live stock. Colorado experiments show that corn shocked and dry cured in the field loses all the way from 25 per cent up to 85 per cent of its value by blowing away and by other losses, largely mechanical, due entirely to climatic conditions.

Cribbing Corn.—A very small proportion of the corn crop of Colorado is harvested in cribs as dry-storage grain. Where corn is harvested in this manner, not over 40 per cent of the total feed value is obtained. Its price and yield must both be good to make this a desirable practice. Ordinarily very much more can be got out of the crop by converting it into silage for feeding dairy animals, or to feed fattening animals.

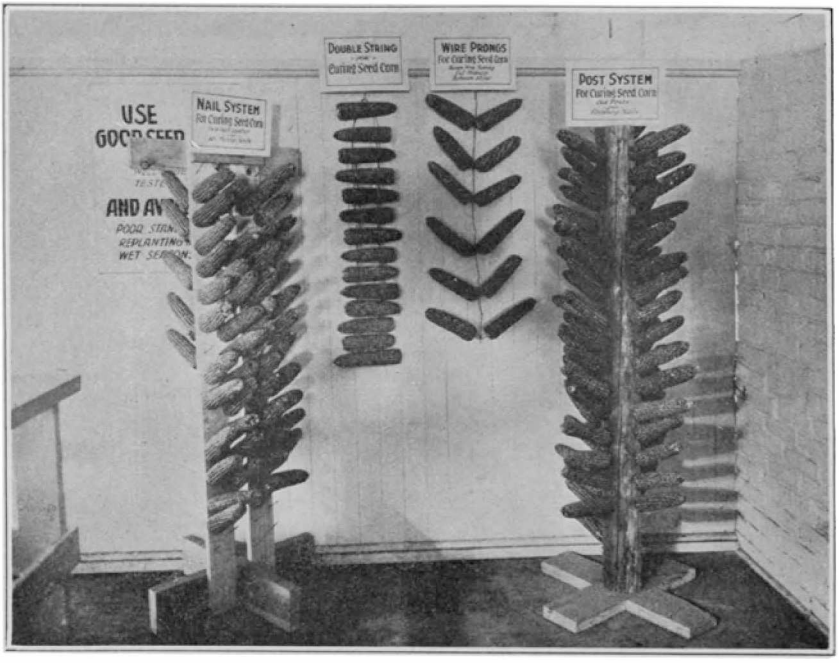
When corn is husked, it should be gathered at the right stage and stored under a good roof in order to reduce storage losses to the minimum. There are a few sections in Colorado where it would probably be advisable to obtain the grain by cutting and

shocking the corn and afterwards running it thru a corn shredder or threshing it out, thus obtaining the shelled corn. The fodder thus shredded, may be stored for feed.

Pasturing Corn.—Turning fattening animals into a corn field to harvest the crop is becoming more and more popular. The labor of husking, cribbing, and later feeding the corn is done away with. The crop is harvested without waste and the manure is evenly distributed over the fields. Probably hogs are most profitably fattened in this way, altho cattle and sheep make very good gains when pastured on corn.

SEED CORN

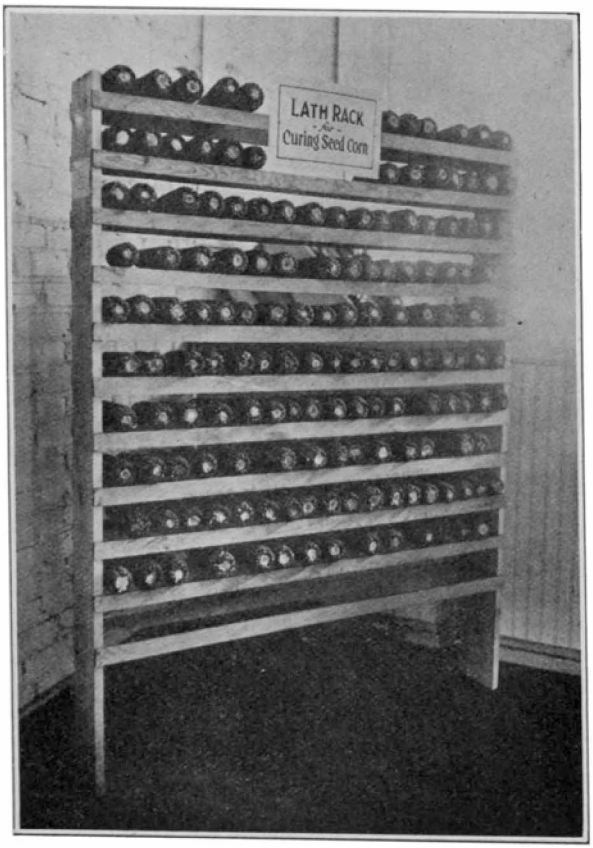
Too much thought and energy can scarcely be applied to seed-corn harvesting. To do this in the best manner, the grower should gather all seed in the field after the corn is fully matured but not yet dry. The seed ears should be selected first for yield. Second, they should be taken from stalks which are fully matured. Such



Home-made devices for curing seed corn. Simple, inexpensive, but very efficient

practice is necessary in order to be sure to gather seed which will ripen under local prevailing conditions. Seed gathered in this

manner is usually snapped or slip husked in the field and completely husked after it is brought in. The husks may be completely broken off and the corn laid on shelves to dry or it may be suspended by string or wire on racks. The pictures on pages 17 and 18 illustrate simple, home-made devices for curing seed corn. These systems of drying all provide for free circulation of air around each ear. Any of these devices placed in a dry, well-ventilated room will be found efficient.



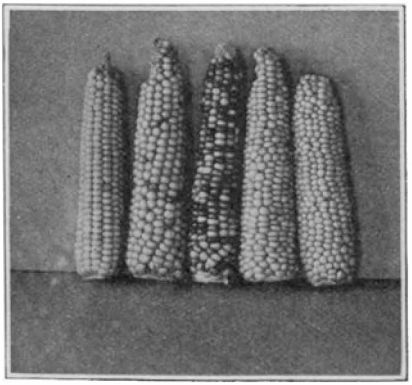
Drying rack for seed corn made of two pieces of 2x6 lumber and old laths

Seed corn should always be well and thoroly dried. From seed properly dried perfect germination can be expected in most instances. Many experiments have shown that corn thoroly dried will stand any amount of cold weather. The small amount of extra

work which is necessary to get absolutely good seed is not expensive when considered in the light of a perfect stand and the yield to be obtained the following year.

VARIETIES

The corn-growing climate of Colorado is short. The varieties adapted to Colorado conditions are mostly early maturing. There are a great number of these varieties found in the State. Some



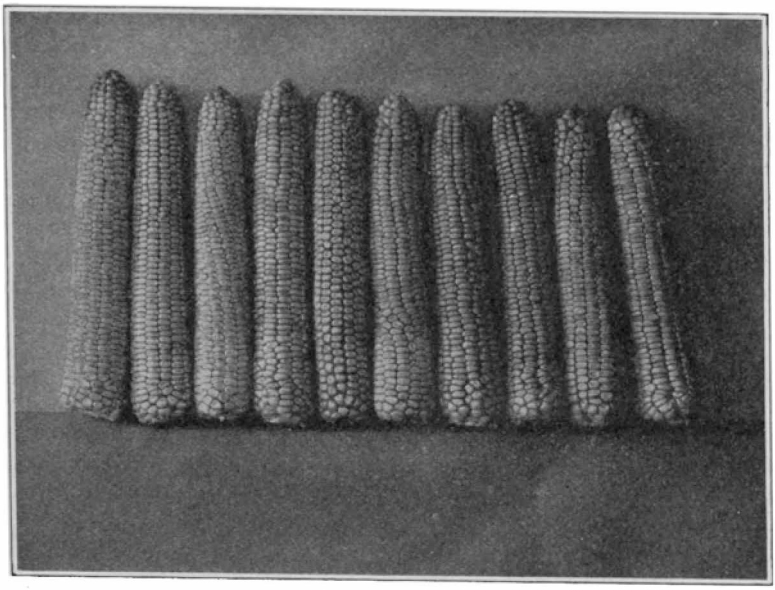
Native Indian corn grown at an altitude of 7,600 feet

were introduced by farmers; others are aboriginal, being grown by the corn-growing Indians of previous Indian semi-civilization. Many of them have been imported. Some have originated by adaptation in different neighborhoods. Owing to the diversity of conditions there are 150 to 200 varieties to be found within the State. Only a few of these have distinct, well-known names. Our observation would lead us to believe that many of the neighborhood varieties, if they were given proper care and properly handled, could be made distinct and valuable sorts. This has not been done, but it shows the possibilities of the crop for adaptation and improvement under widely different conditions. Only a few of the better of these corns can be mentioned.

Swadley Dent.—Probably, all circumstances considered, Swadley Dent should be given a place near the top. Swadley Dent originated in Colorado near Broomfield about 30 years ago from corn introduced from the eastern part of the United States. It has been grown continuously in that neighborhood ever since, as well as in many other districts of the State. Swadley Dent is the result of crossing some Yellow Dent variety probably with White Australian Flint. The variety at present may be best described by saying that the ear is small, the kernels on the ear are yellow with a

white cap and they have the appearance of being rather broad for corn. The cob is rather coarse. The variety is early maturing. It probably grows and does well under as great a variety of conditions as any other variety of corn produced in Colorado. For a number of years it has been tested at Cheyenne Wells. It has been at the top or near the top of the list for a series of years for grain and forage. It is used for a forage crop at this dry-land station.

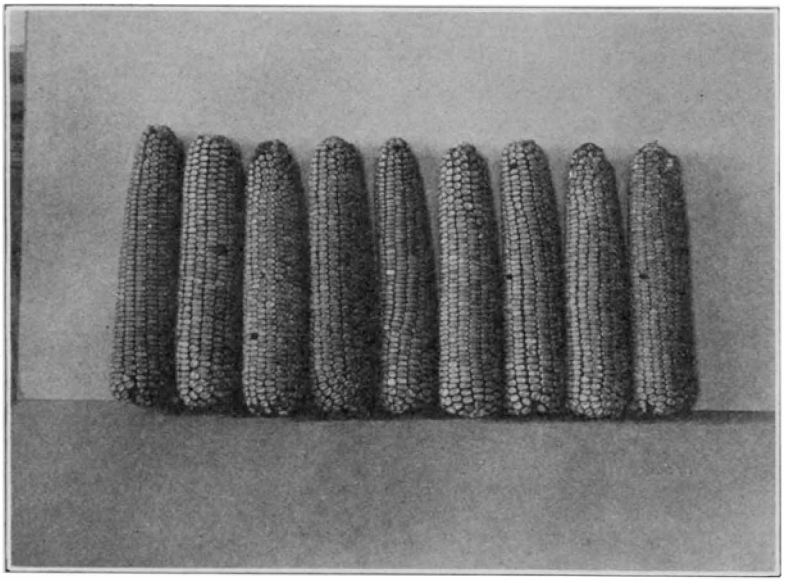
Parsons' High Altitude Corn.—Parsons' High Altitude Corn originated in Colorado near Parker. It was brought out by Mr. E. R. Parsons, a well-known dry-land farmer. It is the result of



Parsons' High Altitude Corn

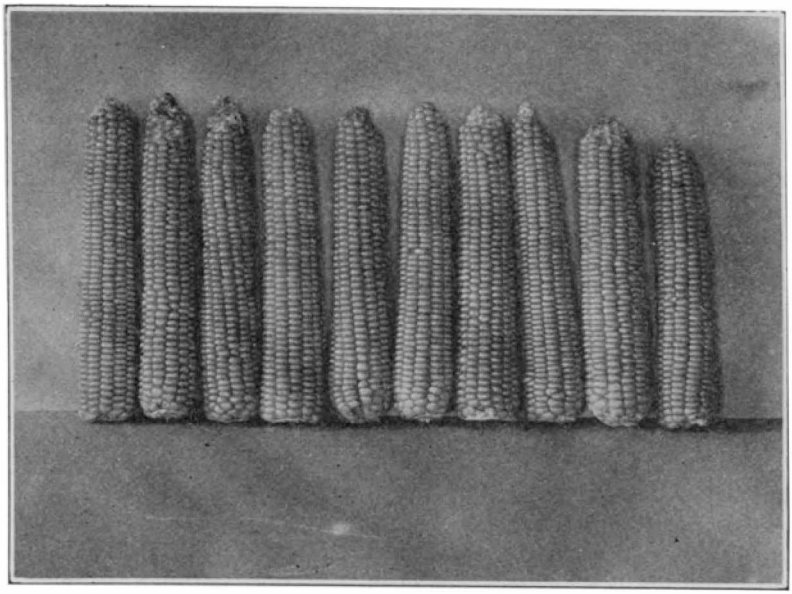
a cross made between white Flint and possibly an early maturing strain of Iowa Silver Mine. The result is a white corn which matures in a very short season. It is very hardy and unusually well adapted for the high divide section lying east of Palmer Lake.

Minnesota No. 13.—This variety was developed by the Minnesota Experiment Station and was first distributed to farmers of that state in 1897. It has shown itself well adapted to some Colorado conditions and is gaining rapidly in popularity. The largest acreage of this variety has been in Boulder county but it will do equally as well under similar conditions in other parts of the State. Professor Bull, of the Minnesota Station, says of this corn: "The color chosen as a standard for Minnesota No. 13 is an old



Minnesota No. 13

gold yellow, bright and of good luster, but not shiny. The space between the rows is a little over a medium. The kernels in shape are the so-called wedge shape with square shoulders at the cap

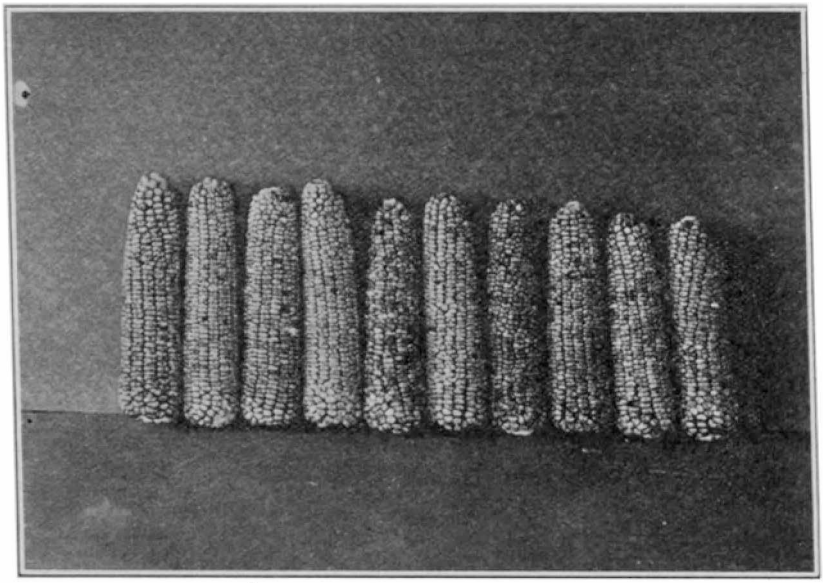


White Australian Flint

and tip. They are about as broad as thick. . . . The cap of the kernels should be very slightly wrinkled. The ears are cylindrical in form with medium-sized butt. . . ."

White Australian Flint.—In White Australian Flint corn, the ear is very long and slender. The kernels are rounding, smooth, and extremely hard. This corn is very hardy. It is one of the earliest, if not the earliest variety adapted to general production in the State. It will grow in extremely dry situations, though it responds well to improved culture. The greatest objection to this variety is not its yield so much as its habit of growth. The ear is produced very close to the ground, the higher the altitude the closer to the ground.

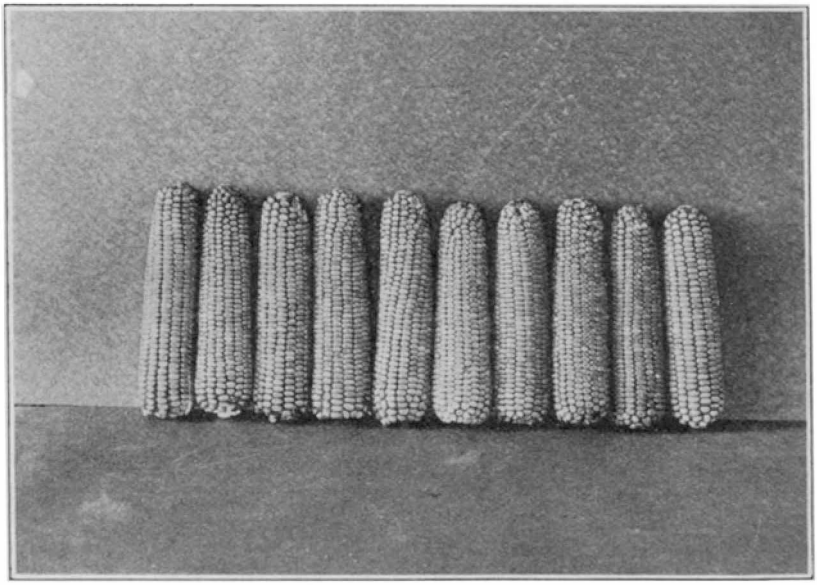
Other Varieties.—The remaining varieties which will be mentioned will simply be listed, giving only a few words of description in regard to each. Farmers Reliance is a yellow dent corn, quite popular in certain sections of Lincoln County. It is deserving of greater distribution. Calico is quite well adapted to dry sections as it is quite hardy. There are two varieties of Calico



Calico Dent

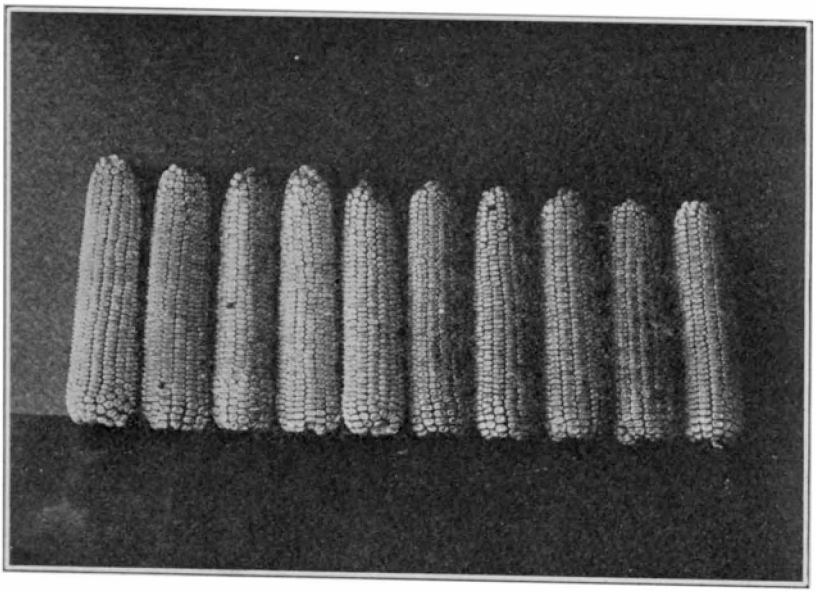
corn, one a dent and the other a flint. The Flint Calico is mostly grown from Pueblo southward, in the mountain valleys and plains. It is very early maturing and hardy. It is probably aboriginal; one of the old Indian corns. Bloody Butcher is a red dent corn. It is grown in a few neighborhoods, but its yield is not great enough

to justify its general distribution. Of the important corns, Wisconsin No. 7, a white variety originating in Wisconsin, has been very promising in the limited number of places where it has been tried. United States Selection No. 133, also originating in Wis-



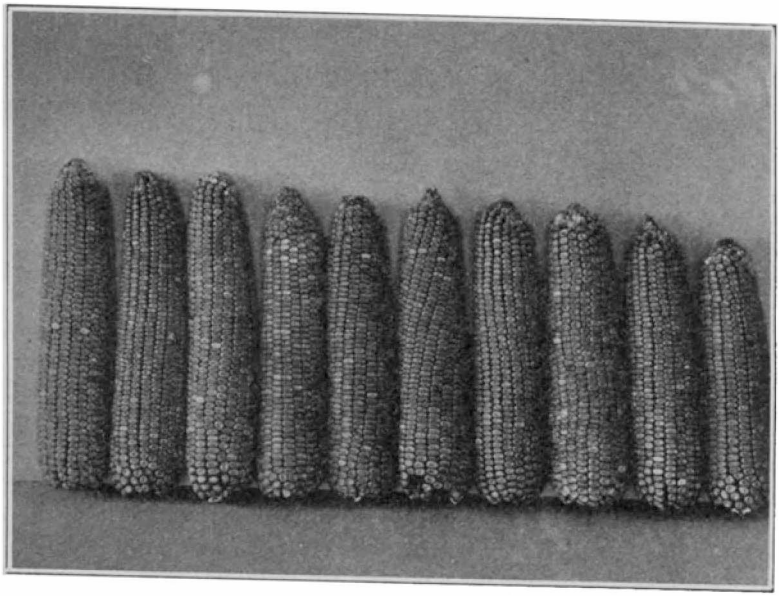
U. S. Selection No. 133

consin, is a yellow corn giving great promise in the few trials which have been made with it. Pride of the North, has been grown to a considerable extent thruout northeastern Colorado. It is adapted, but is not as high a yielder as a number of the varieties already mentioned. Colorado Yellow Dent, a name applied to certain yellow strains of corn of unknown origin, has also done well. Squaw, a name rather loosely used, designates two different types of black corn, sometimes a black flint, sometimes a black flour corn. This is one of the best fodder corns as it matures in a very short season. In many localities it is one of the best if not the best variety to produce, owing to its ability to grow in so short a season. There is a Yellow Flint variety commonly known as Yellow Australian, which is about the equivalent of the White Australian Flint. It apparently does well under the same conditions of altitude and climate. It has quite similar habits of growth. Of the corns which do not mature in quite so short a period, Iowa Silver Mine is used for silage and has been among the best. The Saint Charles White has also done well, especially when used for silage, where the seasons are long enough for its growth. Reid's



Iowa Silvermine

Yellow Dent is grown somewhat in the Arkansas Valley. Occasionally other varieties from outside the State are seen. Leaming and Boone County White have both been grown in this valley.



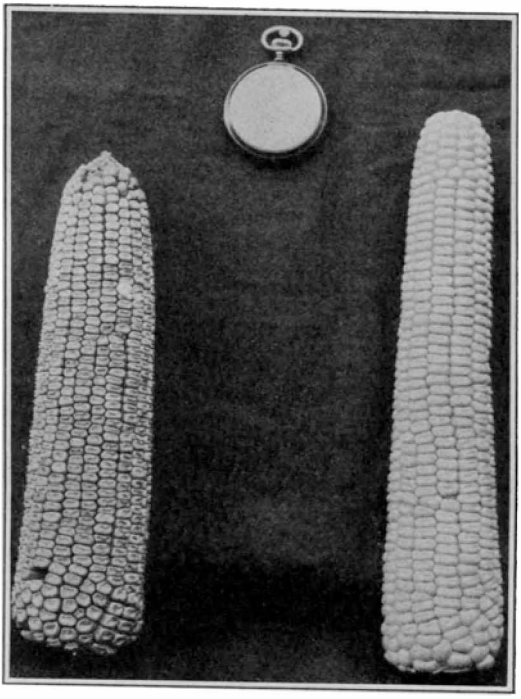
Leaming's Yellow Dent

These corns, however, require too long a season for any of the corn-producing sections, except the Arkansas Valley and the warmer parts of the Uncompahgre and Grand Valleys.

SEED CORN BREEDING

If corn growing in Colorado reaches its ultimate possibility, a great deal of attention will necessarily be paid to the selection of seed. Experiments with the selection of seed corn have shown that show card standing has very little to do with the ability of corn to yield bushels of shelled grain per acre.

What the grower wants is yield per acre and quality. These results may be obtained by performance breeding, the so-called ear-to-row selection. Ear-to-row selection is carried out approximately as follows: A number of desirable, matured ears from desirable stalks are selected in the field. These are dried, stored and cared for in the best manner possible. In the spring, a portion of each ear is shelled and used to plant a row or rows in the breeding test plat. The other portion is labeled and saved. Each row in the test plat is harvested and its yield determined separately. The

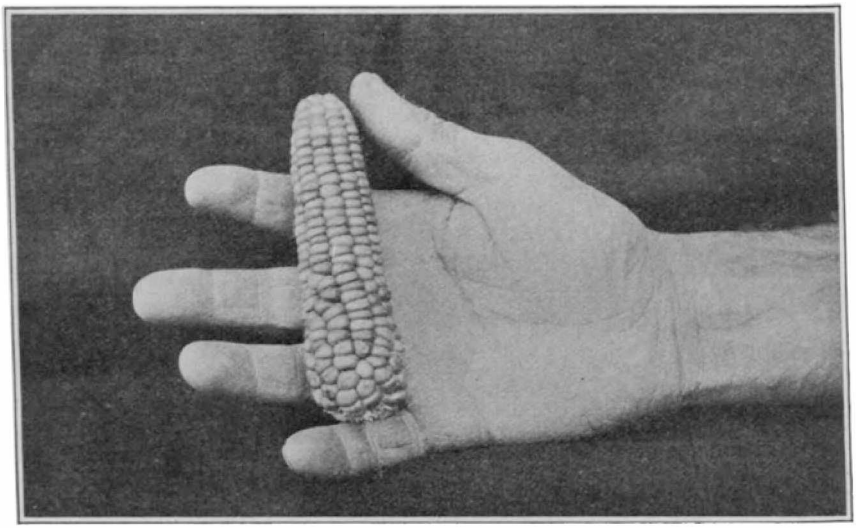


Left—Farmers' Reliance Yellow Dent
Right—Parsons' High Altitude Corn

following year, the kept portions of the ears which gave high yielding rows are planted in a seed patch. Thus, the new seed patch came from seed of high-yielding strains only. Corn from this seed patch is used for planting the general crop. Selection of high-yielding strains may go on indefinitely, constantly improving the average of the crop. Corn responds to selection more readily than most farm crops. Probably no farm operation will pay better returns than careful corn selection. Many farmers will consider such careful work too irksome. These are mis-guided, but their opinions and practices exist.

Where an opinion prevails against selection, much may be accomplished by simply going into the field and selecting good, well matured ears from good stalks. After they are thoroly dry, these ears should be stored in a dry place. Such selection, while not so good or rapid as ear-to-row selection with the seed plat, will make substantial improvement.

The corn crop may be very greatly improved by giving proper attention to the seed, proper soil preparation, tillage, and rotations.



Native Indian corn, grown on the same ranch, at an altitude of 7,000 feet, for thirty years (Photo by Lauck)