

CORN BREEDERS TO COMPETE.

DIRECTIONS TO BE FOLLOWED IN GREAT CONTEST.

Valuable Prizes Offered for Competition in Corn Growing, Under Rules of Corn Breeders' Association—Suggestions as to Land Preparation, Selection of Seed and Treatment.

Columbia, S. C.—Directions to cooperative corn breeders have been issued following the conference of members of the Corn Breeders' Association, State agricultural officials and United States Government agents of the department of agriculture. These directions, which are signed by C. H. Kyle, assistant physiologist, are to be followed by the Corn Breeders' Association of planters in this State, and the results are expected to lead up to the State Corn Exposition to be held here next December.

For the Exposition several valuable prizes will be offered, the State having appropriated \$1,000 for the purpose with the understanding that \$4,000 is to be raised from those interested in this work. For the corn breeders work there was an appropriation of \$500 by the General Assembly.

A Corn—Growing State.

South Carolina as a corn growing State is making leaps. Commissioner Watson's 1909 report that is now being sent out sums up the situation:

"The United States Government figures of November 1st on the corn crop alone, which three years ago amounted in bushels to only about 17,500,000, was increased in 1907 by over 6,000,000 bushels, and again in 1908 by about 3,500,000, being in that year 29,229,000. This year the corn crop is already 37,041,000 bushels, and 88 per cent in quality, a quality nearly 4 per cent above that for the United States, and only a little less than the highest average, which is 88.8 per cent for North Central States, east of the Mississippi. This is an actual increase in one year of practically 8,000,000 bushels, and nearly 20,000,000 in four years. And it has been the direct result of the introduction of proper cultural methods and agitation by the Federal and State Governments in cooperation. But those figures, as strong as they are and as indicative as they are of the capabilities of the soil and climatic conditions, don't tell the whole of the significant story. In all the strictly South Atlantic States the 1909 corn crop shows an increase of only 13,154,200 bushels, and of this total the smallest State of them all shows 8,000,000 bushels, only 5,000,000 representing all the others. In the year also South Carolina shows 8,000,000 of the 98,665,000 bushels increase shown in the nation's crop, or a little over one-twelfth. The real significance comes in the increased yield per acre. In the whole United States there was a decrease between 1908 and 1909 of .8 of a bushel per acre. In South Central States a decrease of 4.6 bushels; and in the North Central States, west of the Mississippi, there was an increase of 4.5 bushels per acre, and in the South Atlantic States of .1 of a bushel. In South Carolina the increase was 2.6 bushels per acre over 1908 and practically six bushels per acre over her ten-year average yield per acre. The work of increasing the corn yield per acre has, too, only just gotten under full sway. Farm demonstration work was begun only three years ago, and not a farm under that work has shown a yield of less than thirty bushels; this year they are running from 35 to 130 bushels, and one 18-year-old boy has recorded, under official inspection, a yield of one acre of 152 1-2 bushels."

Corn Contest.

In a few days commissioner Watson will have completed the announcement for 1910 in the corn growing contest. Last year there was great interest in this contest and already there have been received by the department many letters relative to this year's contest. The first prize was won by John R. Dingle, of Summerton, who made a total yield in bushels of 168.7, the second by A. B. Usher, of Marlboro.

J. M. Moss, of St. Matthew's, won the five acre contest. Out West they print pictures in the magazines of a bushel to the acre man, while in this State a boy raised last year 152 1-2 bushels on an acre. The following are the directions issued this morning, which will be of most interest to farmers throughout the State.

Foundation Stock.

"Adaptation—Select seed that has been grown under conditions of soil and climate like those in which you expect to plant it, if such may be found.

"Mixture—Mixture in seed should be avoided if possible, as it will likely hinder progress. If, however, a choice must be made between a native corn that is more or less mixed, yet of long standing and productive and a pure but radical introduction of unknown possibilities, the preference should be given to the mixed seed.

"The Variety—With equal adaptation and purity, the possibilities for improvement seem about the same for all varieties.

Select Seed in Field.

"Ear Characters no Indicator—So far as known the appearance of an ear indicates nothing relative to its producing power, provided it is sound and well-matured.

"Select in the Field—Seed should be taken only from such parts of the field as have an even and about the usual stand required. Ears should be chosen from those plants that give heaviest yields as compared with those neighboring.

"Stalks that are broken below the ear, diseased or otherwise undesirable, should be avoided.

"Select Early—Seed should be selected as soon as mature, without waiting for it to dry out.

Treatment and Storage.

"Drying—Upon bringing seed from field it should at once be hung or laid up, so that one ear will not rest upon another, and where there is a good circulation of air. Precaution should also be taken that nothing damage the ears.

"Storing—When thoroughly dry, the seed should at once be placed in barrels or boxes that may be closed tightly. If there are any signs of weevil in the corn or storage receptacle at this time, a few tablespoonfuls of carbon bisulphide should be put in a dish and set upon the corn, and the lids tightly fitted for from 24 to 28 hours. The lids should then be raised and the poisonous gas allowed to escape. For each bushel of corn thus stored a pound of moth balls or powdered naphthalene should be inclosed. The lids should be tightly closed at all times, except when examining the seed or working with it.

"Receptacles for Storing—Alcohol barrels or kerosine barrels that have been flamed inside to dispose of oil are very good receptacles in which to store seed, if they have lids that can be made to fit tightly.

"Heavy goods boxes may be readily made into good fumigating and storage boxes by fixing a tight-fitting lid, calking the cracks and protecting the corners and edges from mice and rats with strips of tin. A lining of heavy tar paper (such as used for siding and roofing) may also add to the efficiency of such a box.

Test a Large Number of Selections.

"The grower's chance for finding the exceptionally valuable individuals is increased in proportion to the number of tests that he makes. He should test at least 50 selections, and 100 would be much better.

Seed Must Have Strong Vitality.

"Only ears having bright, undamaged kernels throughout should be retained.

The Test Plot.

"The test plot has for its object the accurate comparison of the productive power of different ears of corn.

"It should be located on land as nearly uniform throughout as is possible to secure. The chances for uniform results may be greatly increased by unusually deep thorough preparation of the land.

"The plot should grow one row from the seed of each ear tested, and the ear and its row should be given the same number, which should be carefully recorded and preserved for further reference.

"Each ear should be represented by 50 plants in as many hills.

"One plant from a sub-standard ear, should be grown in each hill with those to be tested.

"The hills of corn should be planted by hand and in a definite manner, with two plants in a hill—one a sub-standard and the other a plant from an ear being tested.

"For the sake of general uniformity let the first plant in the hill, that is, the plant nearest the row ends at which the work will naturally begin, always be from the sub-standard seed, and the plant from seed to be tested always second in the hill and from six to eight inches from the sub-standard.

Sub-Standards.

"A sub-standard is seed taken from a single plant. It may come from one or more (in the case of prolific corn) ears. Unusual care is taken to discard any kernels of doubtful vitality. Each sub-standard is planted in ten different rows with ears to be tested. Allowance should also be made for the planting of two other rows in connection with a standard, as will be explained later. A letter (a, b, c, etc.) must be given each sub-standard and its exact location in the test plot accurately recorded.

"The sub-standards have for their object the correction of differences in the yields of the rows that are due to soil variation, so that the variations in the producing power of the ears tested may be distinguished.

"The sub-standards in connection with standard, if properly selected, may also serve as a means of determining the progress of the work.

Standards.

"In order that all the tested selections may be compared with a single standard, and hence with each other, all of the sub-standards are compared with another selection called the standard. The sub-standards in this planting are the second members of

the hills, and the standard is the first number. Two plantings of this sort should be made—preferably one on either end of the plot. In case one of these tests should be destroyed or otherwise made unreliable, the key to the season's work will still not have been lost. In case both tests are good, the average results should be used.

"The standard seed is selected in the same way as that for the sub-standards, but should be sufficient for planting in twice as many rows. (Not less than 1,000 good kernels.)

"It is desirable, for possible future plantings and particularly for the standard selection, to have as much seed from any one plant as is possible to obtain; hence in prolific corn more than one ear should be saved from a single stalk and the total amount regarded as one ear.

Seed Used for Sub-Standards.

"The breeder should choose his sub-standard and standard seed so that it will represent the unselected foundation seed or such other seed of the community as he would otherwise have to use.

"This seed should be taken from stalks favored by unusual space. The occasional isolated stalk in a poor stand should be the ideal.

"This method of selecting in the field will prevent the voluntary or involuntary choosing for high or low yielders, and at the same time should give individuals with the maximum number of kernels.

Preparation for Planting.

"Preparing Seed.—Each ear should be given a number. The number should be written on pieces of card board, or very tough paper, about one half inch square. A six-penny wire nail should then be forced through the label into the butt of the ear, so that there will be no danger of the label becoming separated from the ear. Where there have been two or more ears saved from the same stalk, they should be given the same number. (In this case it is well to shell all the seed together and put in a cloth bag.)

"Sufficient seed should then be taken from each ear to plant the required number of hills in its row. It should be put in a small paper bag bearing the ear number. The kernels should all be given individual inspection to be sure that none are in any way undesirable.

"Remnants—The remnants of the ears that are left, after taking enough for planting, should be returned to the storage and carefully preserved.

"Preparation of the Land—The land should have received all necessary preparation previous to time of planting, and if the methods of preparation does not indicate the location of the rows they should be indicated by some form of a marker or by a cord at time of planting.

"A furrow may be opened for the reception of the seed, but, in that case, it should not be opened long enough ahead to permit it to dry out before the seed can be planted. If it is allowed to dry out the stand may be imperfect and will be irregular in the time of coming up.

"Distributing the Bags of Seed—Before beginning to plant it is well to distribute the bags of seeds according to their number upon the proper rows.

Planting.

"Two persons should drop the seed of each row—one always dropping the standard seed, and the other always dropping the seed to be compared. Only one kernel should be dropped in the hill by each. Both kernels should be dropped at the same time and covered by a third person.

"Hand Planters—There are small planters on the market that can be carried and operated with one hand, and their hoppers are replaced by an open funnel-shaped tube—easily made of tin by anyone—may be used by the droppers so as eliminate the man with the hoe.

"These planters will give a more uniform depth of planting than where a hoe is used, and there need be no danger of a dry hill as they make their own hole and cover the seed.

"The soil over each kernel should be given pressure from the foot before leaving it—dry or open soil should be given more pressure than moist soil that is liable to bake.

Harvesting.

"Corn must be Dry—All rows of a test plot, and sometimes all plants in a row, may not ripen and dry out together. Particularly will the large-cobbed, thick ears be slow in becoming well cured. For this reason sufficient time should be allowed for even the latest and largest ears to become air dry; otherwise extra weight, due to moisture may, in calculating results, be mistaken for weight of grain, and an individual be retained for future planting that may be particularly undesirable because of its lateness or tardiness in curing.

"Perfect Hills—In securing comparisons only such hills as contain one productive stalk from sub-standard seed and one productive stalk from the seed being tested are considered. Before marking the corn the number of these perfect hills in a row must be recorded.

"Yields from Rows—Two men should be equipped with bags slung

from the shoulders. One should gather and husk only the corn from the first plant in each hill (sub-standard) and the other should gather and husk only the corn from the second plant in each hill (tested plants,) and the work on each hill should be done simultaneously. The corn thus gathered should be weighed separately and the weights recorded with the proper row number.

"Yield per Stalk—The yield per stalk should then be determined for both the sub-standards and the tested plants.

"Calculated Standards—To secure the calculated standard for each row the difference between the sub-standards and the standard (selection used in comparing all the sub-standards) should be added to or taken away from the sub-standard, according as the case demands. For example, suppose that the standard had produced .0625 of a pound (one ounce) more than sub-standard (a.) this difference would then be added to the stalk yield of the sub-standard in each of the first ten rows and the results would be recorded under the heading "Calculated Standard." If the standard yield had been .0625 of a pound less than the sub-standard, the difference would have been taken away from the standard, and the results placed under the same heading.

"Difference between Calculated Standard and Tested Plants—under the last heading of the record-sheet, we simply fill in the difference between the tested plants and the calculated standard. Where the tested plants have yielded more than the calculated standard the difference is written with a plus sign before it, unless with a minus sign before it. These differences represent the true relative values of the selections tested and those largest differences with the plus sign before them indicate the selections that should be planted and propagated pure.

Remnants to Retain for Future Test.

"When the comparative values of the selections have been determined as above described, all of those remnants should be discarded whose low productiveness bars them from being classed with the twenty per cent that gave highest yields. The high yielding twenty per cent should still be retained for another year's test.

Total Worth of Season's Selections.

"The total worth of the season's selections should be determined by subtracting the average stalk yield of the sub-standards and the standard from the average stalk yield of all the selections tested.

Second Year's Work.

Test Plot.

"Contents—The second year's work should consist of a test similar to that of the first year. It should contain twenty per cent of the previous year's selections, and enough new selections to complete the test's required number.

"Numbering the Selections—The new selections shall be numbered simply 1, 2, 3, etc. as in the past season, and should be planted in rows of the same number. The previous breeding plot selections shall be given the number of the row on which they are now planted, but this number shall also be accompanied by the old row number, written afterward. Suppose the first old selection this year is planted in row 1, and the last year it was planted in row 33, its complete number this year will then be 1-33. These old selections should be so arranged that one will occur in each of the first two rows of each sub-standard.

Breeding Plot.

"Object—The breeding plot is for the crossing and preparation of the high yielding strains found in the previous year's test plot.

"Isolation—This plot should be so isolated that the pollen from other corn can not be blown upon it.

"Land—The land does not necessarily have to be uniform, but should be of average fertility and well cultivated, so that as much seed can be grown as is possible.

"Seed Used—The breeding plot is planted with the remnant seed of the four highest producers of the previous year's test. In making this planting, all of each remnant will be used, except that which is required for planting a row in the test plot.

"Numbering—In the breeding plot the selections are designated by a Roman numeral following the previous year's test plot number.

"Planting—The four selections are planted in separate rows, but the first choice must be alternated with the rows of the other three selections, so that it may shed its pollen upon all.

"Preventing In-Breeding—The following diagram indicates plan for planting and detasseling breeding plot so as to secure cross pollination:

Plan for Crossing Remnants.

21-11 Second choice—detasseled.
33-1 First choice—not detasseled.
42-111 Third choice—detasseled.
33-1 First choice—not detasseled.
7-IV Fourth choice—detasseled.
"Rates of Seeding—It should be observed that, if the remnants are all about the same size, the first choice seed will have to be planted just half as thick as that of the other selections,

because it is planted upon just twice as much row.

"Duplicating—In the case it is not convenient or otherwise advisable to plant all seed in a single long set of rows, the set may be duplicated so as to shorten it to any desired length. In duplicating, however, care should be taken to maintain the same relation between the different selections, and the same should all be recorded so that no mistake will be made in detasseling and harvesting. Better pollenation will probably be secured by thus duplicating the sets.

"Detasseling—When this corn begins tasseling, it should be visited daily, and any tassels on the row from the second, third and fourth choice selections should be removed before they have begun to scatter pollen.

"Caution—Pull out the tassels carefully so as not to break the stalks or injure the leaves more than is necessary.

Harvesting Test Plot.

"The test plot should be harvested, and the results recorded in the same way as in the past season.

Harvesting Breeding Plot.

"Selections for Third Year's Test Plot—Enough selections should be made from each of the four strains represented in the breeding plot to plant ten per cent of the next season's test plot; that is, if the test plot shall accommodate 50 selections, then five should be made from each of the breeding plot strains.

"Selections for General Planting—All of the remaining corn from the detasseled rows that is suitable for seed should be gathered and saved for planting an improved general field the following season. No seed from the rows not detasseled should be used for this field.

Amount of High Productive Seed from Breeding Plot.

If the work up to this time has been properly done there should be of this high producing seed sufficient to plant at least ten acres. Another year this can be multiplied sufficiently to furnish enough of this seed for even the largest farm or plantation.

Mixed Seed for General Planting.

Before planting the seed saved from the breeding plot for general planting, should be thoroughly mixed together.

Continuous Work.

"Test Plot a Court: From year to year the test plot should be made a court in which the best from the unselected fields, the previous test plot, the breeding plot, and the fields of improved seed grown from ears that have already passed the test, must meet yearly and stand solely upon their merits.

"Best Blood Transmitted by Remnants Only—The quality of productiveness should be allowed to pass on into the improved field only by means of remnants of highest yielding ears.

"Present High Performance Required: No matter what the pedigree may show, the highest record of present performance should be required of each ear before allowing its progeny to enter the improved general field, and then only after precaution is taken to prevent in-breeding as prescribed above under "breeding plot."

"Adopting a Different Variety—The test plot court should be kept open to all seed that promise better yields; but should selections from a distinctly different variety be tested, unusual assurance from repeated taken up and the old strain discarded taken up and the old strain discarded.

C. H. KYLE,

"Assistant Physiologist."

Bronchial Tubes All Stuffed Up.

"While a resident of Washington, D. C., I suffered continually and intensely with a bronchial trouble that was simply terrible to endure. I would have spells that I could hardly breathe, I would choke up, fill up in my throat and bronchial tubes, and the doctoring that I did and the remedies used were of no benefit to me whatever. I heard about Booth's Hyomei being so beneficial in catarrhal and bronchial affections and procured an outfit. I received relief from the first by its use. I continued with it and received a cure. It is about two years since I have suffered at all from my former trouble.—Mrs. R. L. Pannell, 404 N. Augusta Street, Staunton, Va., March 26, 1909.

Hyomei is guaranteed by J. F. W. DeLorme to cure catarrh, croup, bronchitis, coughs, colds and sore throat or money back.

A complete Hyomei (pronounced High-o-me) outfit costs \$1.00 at druggists everywhere. This includes a hard rubber pocket inhaler and bottle of Hyomei; extra bottles Hyomei costs 50 cents.

2-7-16-w-3-23.

*Fully nine out of every ten cases of rheumatism is simply rheumatism of the muscles due to cold or damp, or chronic rheumatism, neither of which require any internal treatment. All that is needed to afford relief is the free application of Chamberlain's Liniment. Give it a trial. You are certain to be pleased with the quick relief which it affords. Sold by W. W. Sibert.

News and Courier: Aman with butcher antecedents always will cut up.

\$100 Reward, \$100.

The readers of this paper will be pleased to learn that there is at least one dreaded disease that science has been able to cure in all its stages, and that is Catarrh. Hall's Catarrh Cure is the only positive cure now known to the medical fraternity. Catarrh being a constitutional disease, requires a constitutional treatment. Hall's Catarrh Cure is taken internally, acting directly upon the blood and mucous surfaces of the system, thereby destroying the foundation of the disease, and giving the patient strength by building up the constitution and assisting nature in doing its work. The proprietors have so much faith in its curative powers that they offer One Hundred Dollars for any case that it fails to cure. Send for list of testimonials.

Address F. J. CHENEY & CO., Toledo, O. Sold by all Druggists, 75c. Take Hall's Family Pills for constipation. 3-4-1m.

The Mills Place near Mayesville, fine dwelling, as good land, as any, 14 horse farm open, a real bargain, price \$35 an acre, terms easy. Lots saw timber and wood can be sold readily. Don't wait or you will miss the real Real Estate Bargain now on the market. Possession Jan. 1st. Small payment down secures this elegant plantation. Also A Lot of City property, at sacrifice for quick sale.

J. J. BRITTON, JR. REAL ESTATE 108 N. MAIN ST. PHONE 395

Are You Looking for a Position?

We can offer you good Paying Employment that you will enjoy and at home. Write to-day

Address The Butterick Publishing Co. Butterick Building, New York, N. Y.

Foley's Kidney Pills

What They Will Do for You

They will cure your backache, strengthen your kidneys, correct urinary irregularities, build up the worn out tissues, and eliminate the excess uric acid that causes rheumatism. Prevent Bright's Disease and Diabetes, and restore health and strength. Refuse substitutes.

SIEBERTS DRUG STORE.

KILL THE COUGH AND CURE THE LUNGS

WITH DR. KING'S NEW DISCOVERY

50¢ BOTTLE \$1.00 TRIAL BOTTLE FREE

ADD 31¢ THROAT AND LUNG TROUBLES

WARRANTED Satisfactory OR MONEY REFUNDED

H. L. B. WELLS,

ATTORNEY AT LAW.

Money to Loan on any Good Security. Notary Public With Seal. Office 109 N. Main St.

PATENTS

PROCEDED AND DEFENDED. Send model, drawing or photo for expert search and free report. Free advice, how to obtain patents, trade marks, copyrights, etc., IN ALL COUNTRIES. Business direct with Washington saves time, money and often the patent.

Patent and Infringement Practice Exclusively. Write or come to us at 623 Ninth Street, opp. United States Patent Office, WASHINGTON, D. C.

GASNOW & CO.

60 YEARS' EXPERIENCE

PATENTS

TRADE MARKS DESIGNS COPYRIGHTS & C.

Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. HANDBOOK on Patents sent free. Oldest agency for securing patents. Patents taken through Munn & Co. receive special notice, without charge, in the Scientific American.

A handsome illustration weekly. Largest circulation of any scientific journal. Terms, \$3 a year, four months, \$1. Sold by all newsmen.

MUNN & Co. 361 Broadway, New York Branch Office, 625 F St., Washington, D. C.