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CANTON, SOUTH DAKOTA FRIDAY, MARCH 15, 1907.

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## Characters that Indicate Productive Capacity in Corn

The character of the kernel is one of the most important things to be considered in selecting a high yielding seed ear. Experiments indicate that shape, starchiness, and size of the kernel as well as the character of the germ are of very great importance in determining whether the ear shall be a high or a low yielder.

The vitality of the kernels on an ear are of course of supreme importance, although this quality is determined almost entirely by the manner in which the corn is handled. Much, of course, depends upon the season also, as a wet fall is always responsible for a large amount of corn of low vitality, partly on account of the decay which sets in when the ears are not allowed to dry rapidly and partly because the corn is rarely dry under such conditions when the first severe freeze comes. A well matured ear picked early and thoroughly dried before heavy freezing weather and properly cared for thereafter will almost invariably be found to be of strong vitality. An ear of corn dried early and kept dry will stand almost any amount of freezing, but the ear must be dry. Ears in an open room, even when once thoroughly dried, may absorb sufficient water during a damp spell of weather to be injured by a following freeze. Experiments by the United States Department of Agriculture and by various experiment stations indicate very plainly the value of giving seed corn the proper care. At our own station corn gathered from the farmers' cribs in the neighborhood germinated under favorable conditions only 63 per cent, after a very bad winter, while our own seed, thoroughly dried, germinated over 70 per cent. An experiment conducted by the United States Department of Agriculture in Illinois showed that corn kept in a warm, dry room germinated 97 per cent in the spring after a cold winter; corn in a well aired room, where the thermometer went considerably below zero, germinated 86 per cent, while corn in the crib germinated but 68 per cent. In another test the increased yield of carefully kept seed over crib seed was sixteen bushels per acre under conditions that were exactly similar. The Nebraska station reports a germination of 90 per cent from seed properly dried, against 70 per cent for seed kept in the crib, while of this 70 per cent many plants were weak.

It is usually possible to tell by a simple examination whether or not the kernels are of strong vitality. If the germ is discolored, blistered, wrinkled, or roughened near the point its vitality has usually been injured. It should be smooth, bright, clean and when broken or cut across it should show a fresh, oily appearance. The tip of the kernel adhering to the cob indicates a weakened vitality. It is not possible to be sure that any kernel will grow by a casual examination, however, as the freezing leaves little to indicate the damage it has done.

The size of the germ seems to be of considerable importance in indicating the strength of the plant that will be produced from a kernel of corn, although evidence on this point is not conclusive. It must be borne in mind however, that the germ that appears largest on the exterior of the kernel may be shallow and not the heaviest in weight, although as a rule a heavy germ will be one which has a large surface expansion.

Again, under favorable conditions it would be expected that the score of plant food surrounding the germ would be of importance, and with kernels of equal size a large germ would mean less room for food storage. In this connection certain experiments conducted in our laboratories by Mr. A. E. Grantham are of interest. The plan of these experiments was to determine if possible the relations which size, weight and character of both kernels and germs bear to the rate and strength of germination and to the ultimate growth of the plant. It was found that in every instance the large germs made considerable more growth in a period of fourteen days than the small germs, as is shown both in the height of stalks and in the weight of green matter produced, measuring from two and one-half to three inches higher and weighing from 40 to 50 per cent more in green matter. Experiments at the Maryland station showed practically the same thing. Although these experiments have not as yet been carried to the field there is good reason to believe that the stalks that make an early thrifty growth will stand much better chance of being high producers than those which are weaker at the start and all evidence indicates that the corn plants which grow steadily from the time they have reached a full height are the best yielders under average conditions. Any condition, therefore, that will cause a weak stalk, whether it be injury by freezing, by rotting, or by an

imperfectly developed germ will decrease the yield of corn under normal conditions, and ears bearing kernels of weak vitality should be discarded.

The size of the kernel is also largely responsible for the character of the stalk produced. Naturally those kernels that have a large food supply would be expected to produce the largest plants although this statement cannot be made without qualifications. There are many conditions of soil, season, and variety that must be considered. Evidently a plump kernel is more important, than a large kernel. Reference to the results of the experiment above referred to shows that with two trials each covering fourteen days' growth, the height of the stalks from the heavy kernels was three inches greater than for small kernels and the weight of green matter was approximately 50 per cent more. Variety and adaptation are of much greater importance than size of kernels, however, for it is a well known fact that Reid's Yellow Dent with its small kernels is one of the best yielding varieties known, especially for the upland soils, while the large-grained varieties of coarse character rarely equal it.

The shape of the kernel is of importance in its influence on the size of cob and the character of germ. A long kernel is almost invariably a sharp pointed kernel with contracted germ and such a kernel is rarely strong in vitality. Experiments with long, short, and medium length kernels of the same variety showed for the long kernels a growth of 45.47 grams green matter with seven undersized plants, and for the medium length of kernel 65.6 grams green matter and three undersized stalks. The results point plainly to the superiority of the medium lengths of kernels for producing a thrifty early growth of plants.

The character of the indentation on an ear has been held to be of considerable value in determining its productive capacity. It is well known that the rougher ears are later in maturing and the superfluous seed coat which in wrinkling causes the roughened indentation has been taken as an indication that the ear had greater capacity for filling out than the soil or season allowed. Such an assumption is largely theory, however, and so far as I am aware there is no experimental data available which deals with the matter. In our own breeding blocks this year the smoother ears yielded appreciably higher than the rougher ones, but the season was very dry about the time the corn was earing, and it is probable that rows from the smoother ears, being slightly earlier, were not so badly injured by the drought. A medium rough variety is usually a heavier yielder than a smooth variety especially on the richer soils, although a very rough ear has a tendency to be high in starch and low in protein. High protein kernels make more thrifty young stalks than the starchy kernels, and considering the higher feeding value are usually to be preferred. Considering both yield and quality, however, a slightly roughened ear is better than a smooth one although the degree of roughness allowable will be determined largely by soil and variety.

M. F. MILLER,  
Missouri Agricultural College.

## School Officers Meeting

AN EXCELLENT PROGRAM WITH  
SPEECHES AND AN ILLUSTRATED LECTURE.

County Superintendent Lawrence and the district school officers held an interesting session Monday forenoon and everything pertaining to schools, school work and school books was discussed from a progressive standpoint. It was the first regular meeting of district officers with the new superintendent and from the number who attended and the interest manifested it was evident that harmony of action and purpose will be the dominating feature of the year's work.

Superintendent Lawrence felt highly pleased with the session, which adjourned to take part in the afternoon program. The afternoon program opened at 1:30 with music by the Griegs which was followed by an address of welcome by Mayor Genmill which was responded by Mr. Weaver. Rev. George S. Evans delivered an address on practical education and another song by the Griegs brought the program down to State Superintendent Ustrud, who made his first appearance before a Lincoln county audience, and it was an audience composed of men and

women who are deeply interested in educational matters. Every seat on the main floor was occupied when the State Superintendent began his address.

He discussed every point of interest to school officers and reviewed the school laws briefly. He spoke of joint institutes, examination of school officers accounts, and gave statistics covering many interesting points concerning our state educational system, of which we enumerate:

RURAL SCHOOLS.	
Average salary of teachers per year	\$227.00
Persons of school age	100,473
Attendance	74,450
Average daily attendance	39,964
Pupils in 8th grade	4,942
Pupils in 1st grade	16,106
School levy	8 mills
Paid for teachers salaries	\$955,404
Total expenditure	\$1,500,000
Teachers employed	4,228
Cost of education per child	\$15.00

INDEPENDENT DISTRICTS	
Ind. district ave salary	\$442.00
Persons of school age	41,743
Total expenditure	\$1,036,624
Tax levy	17 1/2 mills
Cost of education per child	\$25.00
Teachers employed	928

Superintendent Ustrud continued his discussion of school affairs pointing to the necessity of hearty cooperation on the part of patrons, teachers and county superintendent for success in the rural schools. He made an earnest plea for the success of rural schools and urged that the pupils be given every advantage because they were entitled to the best. He was heartily applauded when he retired.

The closing number on the program was the illustrated lecture on rural schools by Prof. J. C. Kern, of Rockford, Illinois.

State Superintendent Ustrud secured Prof. Kern for six lecturers in this state, and he was fortunate in being able to get him because of his limited vacations for the work, and Lincoln county was accorded the honor of the opening number.

The court room had been prepared for the event under the direction of County Superintendent Lawrence and Janitor Manson manipulated the machinery that drew the window blinds close, shutting out daylight. A great white screen had been arranged over the judge's desk in which the rural school scenes were fairly well depicted.

Prof. Kern called his lecture "New Agriculture in the County Schools," and stood out before the audience with a big ear of corn in his hand. He didn't dwell long on the corn question but it was an illustration of what should be taught in the modern school. He spoke of 100 bushels

of corn to the acre, but to secure this you must have 100 bushel soil and a 100 bushel man.

He gave a great many views of school houses, old and new, in his own county around Rockford, and showed the old unpainted outfit with broken siding, windows and tumble-down sheds and then he showed the modern structure fenced and painted, with flowers and vines all around, and the evident pride of the scholars who attend the modern up-to-date school compared with the listless, don't care slovenly appearance of those who attend the old wooden bench, roof leaking outfit, proving that environment had much to do with the future of the scholar.

His lecture was a magnificent plea for better rural school buildings, with trees and flowers and other attractions to impress upon the youthful mind a love for the beautiful in nature and how these same youthful pupils might be taught how to do these things, giving practical lessons which would remain with them thru life. He showed in his pictures how boys had been taught to raise flowers, corn and other things at school and at home and how these boys and girls had developed the beautiful in nature, destroying in a great measure any desire to leave the farm for the hurly-burly of city life.

It is fair to presume that the rural schools in Lincoln county will show great improvement before the leaves begin to fall again. It is also equally certain that there will not be an unpainted school building in the county before fall school opens, and we hope to see every school house yard filled with ornamental shrubbery and flower beds, because the necessity is great and the opportunity is open to every teacher in the county.

There were perhaps one hundred and fifty rural school officers in the court room during the lecture and each of them could realize the power and force of those pictures. They knew they were true to life because Lincoln county has had some just like them—the old ones—but none now we believe. The speaker told of an old fellow over in Illinois who was kicking over the building of a new school house. "Why," said one of the modernized patrons, "the children are suffering for ventilation in the old rookery." "I don't care a continental," said the old fellow, "I had no ventilation when I went to school." And there you are. It is not what you had my dear old friend of Moses, it is what modern conditions demand, it is what your children must have to make them thoroughly American in spirit, temper and pride. The American farm home must be made an ideal residence. Flowers and paint and ornamental

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shubbery don't cost much if you want to keep the boys at home.

The rural school is the nursery by which all these things may be taught without loss of study.

It is the aim of County Superintendent Lawrence to urge this work upon the district officers and teachers and he hopes to see practical progress in every district during the year, and it is the determination of State Superintendent Ustrud to keep up this work until every county Superintendent in the state is doing his duty in this direction.

The LEADER wants to see Lincoln county the banner county in the state with reference to general improvement in rural schools, and to this end the LEADER will give to the district showing the greatest improvement during the year a ten dollar prize in books or pictures, or anything selected, when the county superintendent names the district entitled to the same.

This may induce the pupils and teacher and district officers to do something and the district winning the prize will win pride and glory worth ten times more than any prize we might give.

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