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CROP CONDITIONS AND PROSPECTS.

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THE year 1895 will be agriculturally remarkable in more than one way; but the leading characteristic now indicated for it is a restricted area and wide-spread failure of cotton and winter wheat, joined with a largely increased extent and exceptionally fair promise of Indian corn and potatoes.

It is only a coincidence that this temporary replacement of our leading export staples by these native American products should have come when the season was exceptionally favorable for the change, but the coincidence was singularly fortunate. Several causes had for years been working together to bring down the prices of commodities, and their effect had culminated in 1894; wheat in leading markets had reached a figure never before known, and cotton, a figure equalled only in one or two years, about 1845; the corn price, owing to the shortness of last year's crop, had risen to nearly the wheat level; so that it was altogether natural that the attention of farmers should be turned this year from wheat and cotton to corn. This was shown by a decline in cotton acreage, from which only Texas and Oklahoma were excepted, along with a general contraction of the winter and spring wheat area, reported early in the year to the Department of Agriculture, and followed by high percentages, distributed almost uniformly over the country, of acreage in corn and potatoes. The incalculable and inscrutable visitations of Jack Frost and Jupiter Pluvius, also, were very partial in their treatment of the different crops. A brief history of the progress of the season with a few of our leading farm products will have some degree of general interest.

Winter Wheat.—Acreage sown, as compared with 1893–4, estimated at 103 per cent.; acreage finally harvested, at 96 per cent.

There was no material falling off in the Pacific Slope region, but the great growing States of the interior—Michigan, Ohio, Indiana, Illinois, Missouri, Kansas—suffered a great reduction in area. Dry weather at seed-time delayed sowing, prevented germination and stunted the plant's growth; severe cold in the winter, followed by abrupt visitations of thaw and frost in the spring, and concluded by a general drought and prevalence of insect pests throughout the principal producing States, did the rest. Many acres beyond the Mississippi were plowed up for corn. The figure for "condition," by which is meant the proportion, expressed as a percentage of the expected crop to a "full" crop—not the crop of the preceding year or of any particular year, or even the average of a series of years, but an ideal crop, the crop accepted as satisfactory to the producer—this "condition" sank for the United States as a whole, from 83 the first of May to 71 the first of June and 66 the first of July. It thus appeared that our farmers generally, just before setting about the harvest of this grain, expected less than two-thirds of a crop. Yet the yield was good in the northern States of the Pacific Slope, and better than usual in New Jersey, Delaware and Maryland. If the country had to depend for the great bulk of its wheat on these States, the year would be counted among the fat and not the lean ones. The condition at harvest time, both for winter and spring grain, will be reported in September.

Spring Wheat.—The area sown in this grain is reported as within 1 per cent. of 1894, and the condition as very good—98 at the beginning of June, 102 in July, and, notwithstanding great reported, and some actual, falling off, still as high as 96 in August. In the chief spring wheat States, Minnesota and the Dakotas, the season proved much more favorable to this grain than in the great food reservoirs to the south of them.

Hay.—The causes which reduced the area and condition of winter wheat were equally detrimental to clover and timothy. The June report showed that the clover acreage was one-thirteenth less, on the average, than that of the previous year, while the condition was 83 per cent. only. Here, as in the case of wheat, the Atlantic and Pacific slopes showed fairly well, while the great interior region was scourged by dry weather, a severe winter, late frosts, and insects. By July the North Atlantic region had suffered further damage, and the Central States no improvement;

the only parts of the country that came up to a fair average were the Pacific slope and the South Atlantic and Gulf strip, where little hay is usually raised. Condition had fallen to 74 for clover and 71 for timothy; by the first of August these figures were 67 and 70, with clover estimated at 87 per cent. of standard quality, and an aggregate hay acreage but 91½ per cent. of 1894.

Oats.—Acreage increased by 3 per cent., as reported June 1; average condition at that date, 84; by July, 83, and by August 84 again. Some damage by dry weather and insects in the Central States, but a good crop in the North Atlantic and the Northwest.

Cotton.—Area everywhere reduced this year, in consequence of the low price. Only Florida, Oklahoma and the Indian Territory returned as much as 90 per cent. of last year's acreage; Arkansas, Tennessee and North Carolina showed barely 80 per cent., while the Cotton States proper were intermediate; general average 85. Nor was this reduced extent at all compensated by improved condition, the figure expressing this being 81 in June, 82 in July and 78 in August. Taking area and condition together, and comparing with last year's August condition of 92, we may infer a total product amounting to but 72½ per cent. of last year's. But this great reduction would still give us some 6,900,000 bales, a larger crop than the country produced in 1892, or in any other year before 1887, with a single exception. The reasons assigned for this year's poor condition are the backward season, by which planting was notably postponed in every State but Florida, and the encouragement given by copious rains to the growth of grass and weeds.

Potatoes.—Area 8 per cent. greater than in 1894; increase generally distributed, including the nine States of largest product, and only seven States showing a decrease. Condition fair; 91 in July and 88 in August. Last year 92 and 74 at same dates, and total crop 170 million bushels. The prospect of a two hundred million bushel crop this year is by no means slender, and an excess over the 1889 figure—our highest hitherto—of 218,000,000 bushels, is altogether possible.

Corn.—The corn acreage shows an all but universal increase, but two States reporting a falling off from last year. General average advance 8 per cent. Condition exceptionally high; 99 in July and 102 in August. The corn record is now held by the

1889 crop of 2,122,000,000 bushels, although that of 1891, amounting to 2,060,000,000 bushels, had a total value 40 per cent. higher, because that year's failure of cereals in Europe sharpened the demand for breadstuffs. There will be grave disappointment if the 1895 corn crop fails to surpass all previous experience, and a product of 2,460,000,000 bushels may be quite reasonably expected. Last year's crop, cut down by drought to the piteous tale of 1,212,770,000, will in this case be more than doubled. Timely rains have advanced the corn crop in almost every section, particularly in the Cotton States; the same agency that proved adverse to their leading staple has favored the one they substituted for it.

The numbers called for brevity "condition" express in brief compass all that can be predicted for the growing crop. As reported by the correspondents of the Agricultural Department they express so many judgments of what the product is to be, in their several counties, by comparison with what their experience and study of the agriculture of those counties lead them to expect in fairly favorable seasons. A great deal has been thought and said about this subject of the standard for comparison in agricultural estimates. The most convenient mode of reference for the statistician would probably be the average crop, taking the mean yield of a series of seasons, bad and good as they come; this would give us about as many conditions in excess of 100 as short of that figure. Accordingly, in the statistical service of some countries, and some of our States, the reporter is asked to compare his expected yield with an "average yield." In a great number of cases, there can be no question, this comparison is quite accurately and scrupulously made. A record of several years being kept, the mean of all, successes, half-successes and failures, is adopted as 100, and each estimate of a prospective crop-yield is noted according to its proportion to this average. But in a greater number of cases, those who are expected to follow this plan really follow another plan. Having no exact record of a series of years to guide them in striking their average, their standard is derived from their impressions as to what ought to be, more than their knowledge of what has been; it is set by their successes and takes no account of their failures, which it regards as accidental and not normal; so that when they tell you of a "full crop," or an 80 per cent. crop, or a two-thirds crop, they mean that propor-

tion of a good and not merely a mean crop. The mixture of estimates on this basis with those relating to a regularly determined mean, which must always occur when "average crops" are named, is sufficiently suggestive of confusion to raise very natural doubts of the value of statistical returns in which they occur; and the total effect of such mixture is to give a value to the condition 100 quite different from that contemplated.

This is conclusively proved by examination of the figures themselves. If 100 denotes an average, as pointed out above, there will be about as many returns above 100 as below, in a succession of years. Since, in practice, estimates in this form are sure to show a preponderance of returns below 100, it is evident that 100 really indicates something higher than an average. The records of the United States Department of Agriculture come to the aid of foreign records on this point. Clear as was the understanding of the first statistician, Mr. J. R. Dodge, on this point, and careful as he generally was to insist that his standard was a full yield and not an average yield, the questions as to his peaches and to one or two other fruits, in a few of his circulars, were made for an extended succession of years to relate to condition "compared with an average crop." As a result, the returns are almost solidly below 100, showing that the correspondents interpreted their par of reference as something higher than a mere mean, even when explicitly instructed otherwise. That this habit of fixing a standard higher than the level as often as not attained may be taken as a fixed fact in human nature, is acknowledged in an interesting manner by British testimony. While the agricultural papers of that country have long made a practice of asking for comparisons with an average crop, the *Times*, in its valuable series of crop reports, has adopted the standard of "perfect healthfulness, exemption from injury (due to insect or fungus pests, drought or wet, cold or frost), with average growth and development"; which amounts virtually to the same that has been recognized for many years in agricultural reports on this side of the Atlantic.

Since the choice of a standard condition is determined by the character of the reporters and their habitual manner of thinking, it is not remarkable that some difficulty should be found in converting it to an exact quantity in bushels per acre. As already admitted, the mean of a series of years, if it were possible for

a great army of untrained reporters practically to apply it, would be more definite and better suited to the purpose of immediate statement in figures. But it is quite possible to make the "full crop" or "normal yield" as exact a measure of quantity as a regularly determined average, by the process of comparing the condition estimate made when the crop is secured with the yield as finally ascertained. For example, if wheat is judged to be 80 per cent. of a full crop when harvested, and the product was afterward found to average 12 bushels per acre over the same territory, it follows that the normal yield answering to the condition 100 must be accepted as 15 bushels per acre.

Mr. Dodge made, in 1892, a calculation of the kind just indicated, from which he found the normal yield of corn, the country over, to have been for a dozen years almost constant at 28.6 bushels per acre. The highest figure was 30.4 and the lowest 27.5, the years 1882–83 being above the average and 1884–87 below, this slight loss being recovered after 1888. Mr. H. A. Robinson, the present statistician of the Agricultural Department, decided a few months ago to make a special inquiry into this question. Every correspondent of the department was accordingly invited to set down in figures the normal yield of wheat, corn, etc., in his county, so that this numerical basis of reckoning might be more directly calculated. Full returns from all parts of the country, received in July and August, gave 29.4 bushels, showing a substantial concordance with Mr. Dodge's estimate, and a general fixity in our standard of corn cultivation. It should be borne in mind, however, that the corn yield of the year 1889 was shown by the eleventh census to be decidedly higher than the value used in Mr. Dodge's calculation (a practically identical total crop having been produced on an area 8 per cent. less than the Agricultural Department's estimate), and that the yields for the years preceding 1889 were doubtless affected similarly, in gradually increasing measure. Allowing for this, and amending the calculation accordingly, the mean normal yield for the fourteen years ending 1894 becomes 29.9 bushels. But in view of the uncertainty of the correction applied, it will be safest to use the number 29.4, directly determined, as expressing what is meant by a corn condition of 100.

A similar computation for wheat shows no such uniformity, but a marked increase, Mr. Dodge's reduction giving 13.7 bushels for

the years 1881-84, 14.5 for 1885-90, and after those years more than 15. But the census reduced, as in the case of corn, the area estimate of 1889; for the wheat acreage of the Agricultural Department that year, though determined with the usual care and judgment, was no less than 13½ per cent. in excess of that returned by the census. Allowing for this difference, an addition of 1.08 bushels per acre must be made to the actual yield, and 1.23 bushels to the normal yield; so that if we suppose, as appears most reasonable, that this correction was a gradual accumulation, one-tenth of it being applied to the yield from the Department's figures for 1880, two-tenths for 1881 and so on, we find an average of 14.1 bushels per acre for 1881-84, 15.4 for 1885-90 aud 15.7 for 1891-94. Mr. Robinson's inquiry of county correspondents, as to the local normal yield in each county, brought results in fairly close agreement with the last of these figures, the average of winter and spring wheat for the whole country coming out 15.6 in July and a little over 15.7 in August. We may follow Mr. Dodge in ascribing the increased wheat yield (equally undeniable whether we are or are not governed by the census returns of acreage) to two causes: movement of cultivation to better lands, particularly in California, and improvement in agriculture generally. Until a further increase is noted the general normal yield or the par of condition for wheat may be accepted as 15.7 bushels per acre; the condition 66 for winter wheat therefore, indicates 10⅓ bushels per acre, or 234,000,000 bushels in the aggregate, while the spring wheat condition 96 indicates a very little over 15 per acre or a total product of 169,000,000 bushels. These figures are preliminary only; correspondents will furnish more precise returns after the crop is everywhere housed, and be yet more precise about the end of the year, after threshing has fairly indicated the quantity and quality of the grain.

The weak point in all the crop statistics of the Agricultural Department is the evaluation of the area sown, or what is known as the acreage of the crop. The yield per acre can be fairly estimated by well-informed and experienced reporters, and the estimate of "condition" is one whose definiteness in practice is even surprising to those who only know how difficult the expression is to define in straight plain English; but for the number of acres, a factor whose ascertainment is vital to a knowledge of the total crop, there is no standard and no mark to guide the explorer back

to the truth whence he has been led away. The best standard that can be used in practice is the acreage of the census year; but since it is impossible for the estimator to bear that in mind all through the decade, he necessarily has to compare each year with the year before, so that every return of area has in it all the uncertainty of the census determination, added to that of one or more—perhaps ten—independent comparisons, all highly fallible, of this year with the one just preceding. That such a chain of comparisons is capable of leading far astray, is a necessity, and it has been illustrated in more than one place above. But when we have shown a divergence between Department estimates and census returns we have shown by no means the worst feature of the case. In a candid statement of fact, it is necessary to confess that the census acreage figures, in both corn and wheat, have been distrusted. Justly or unjustly, there is a widely prevalent suspicion that the areas in the eleventh census were too low. This suspicion is based to some extent on theories as to wheat consumption per head of population, and it is the office of crop returns to test such theories rather than be tested by them; but a way ought to be found to set these returns above suspicion.

The true way to attain this desirable end is to secure frequent and accurate determinations of the area under all the principal crops, which can only be done by an annual, or at least biennial or triennial, farm-to-farm census. To inquiries as to area others could easily be added without considerable additional labor or expense, but the question of acreage should always be kept foremost, and its precise report be regarded as the main object of the undertaking. It is almost needless to repeat the arguments for frequent agricultural censuses, since they must be clear, cogent and irrefutable in the most hasty consideration of the subject. If such a census were taken every other year, say, not only would all agricultural statisticians and students be furnished with firm ground to stand on, but each and every census would, by the development of greater skill and capacity among those in charge, be better than any of our decennial censuses can now be. If there is a shred of truth in the maxim that what is worth doing at all is worth doing well, the filling of this lamentable gap in the practice of crop reporting is a thing worth doing. The end of the century ought not to see the gap unfilled.

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