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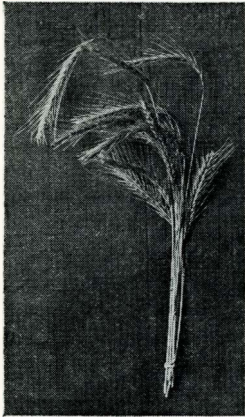
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The Date of Seeding Winter Rye

When the Ground Is Dry or Wet

A. N. HUME, E. W. HARDIES, AND CLIFFORD FRANZKE

THE hardiest winter cereal for fall seeding is winter rye. This fact was pointed out in South Dakota Experiment Station Bulletin 161, "Winter Grains in South Dakota." This hardiness of rye goes far toward insuring that the crop will be productive one season with another, and productiveness is a very decisive factor in determining whether a crop is profitable and therefore popular.



Winter rye is not the most important crop in South Dakota, ranking tenth in value in 1925; but the figures of its production indicate that, within the variation which can be expected, it is increasingly important in recent years. Figures in Table I, secured mainly from the United State Department of Agriculture yearbooks, summarize the trend of winter rye production in South Dakota for a fifteen year period.

The acreage seeded to rye in South Dakota previous to 1911 was merely nominal although the acreage of that year was lower than for some years previous. During the war period, the rye acreage was higher than it has been subsequently. Very possibly some falling off of acreage in subsequent years may be attributed to a smaller market demand which of course did not apply to the rye crop alone. These figures of rye production indicate that the crop already holds a secure place among South Dakota crops. Its general character of usefulness and hardiness warrants the forecast that its popularity will increase rather than diminish.

At the present time, interest in winter rye on the part of prospective growers is evident. This interest gives rise to questions not only about the general methods of seeding and handling but also special questions arising out of conditions peculiar to the given season. One of the

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important considerations is the time of seeding. The question arises in the minds of growers whether or not seeding of winter rye should proceed regardless of the amount of moisture which happens to be present in the soil in the fall, whether that amount be much or little. One prospective grower wishes to know whether it is advisable to sow winter rye in the fall under dry conditions; will winter rye make a crop if it does not germinate until winter or early spring?

TABLE I.—PRODUCTION AND VALUE OF RYE IN SOUTH DAKOTA FOR 15 YEARS

| Year | Acres in thousands of acres | Total production in thousands of bushels | Bushels per acre | Farm price per bushel (cts.) | Farm value of crop in thousands of dollars | South Dakota farm value per acre |
|-----------|-----------------------------|--|------------------|------------------------------|--|----------------------------------|
| 1911..... | 13 | 130 | 10.0 | .76 | 99 | 7.60 |
| 1912..... | 16 | 312 | 19.5 | .52 | 162 | 10.14 |
| 1913..... | 50 | 660 | 13.2 | .50 | 330 | 6.60 |
| 1914..... | 60 | 1,020 | 17.0 | .78 | 796 | 13.26 |
| 1915..... | 90 | 1,755 | 19.5 | .76 | 1,334 | 14.82 |
| 1916..... | 250 | 4,500 | 18.0 | 1.18 | 5,310 | 21.24 |
| 1917..... | 350 | 5,600 | 16.0 | 1.55 | 8,680 | 24.80 |
| 1918..... | 575 | 10,350 | 18.0 | 1.41 | 14,594 | 25.38 |
| 1919..... | 505 | 500 | 13.0 | 1.25 | 6,500 | 16.25 |
| 1920..... | 350 | 4,320 | 13.5 | 1.09 | 4,709 | 14.72 |
| 1921..... | 191 | 3,056 | 16.0 | .58 | 1,772 | 9.28 |
| 1922..... | 506 | 9,108 | 18.0 | .58 | 5,283 | 10.44 |
| 1923..... | 304 | 3,496 | 11.5 | .49 | 1,713 | 5.64 |
| 1924..... | 219 | 2,956 | 13.5 | 1.02 | 3,015 | 13.77 |
| 1925..... | 201 | 1,910 | 9.5 | .67 | 1,280 | 6.37 |

In Bulletin 161 of this station, the statement was made that rye seeded too late to germinate in the fall or seeded very early in the spring at Highmore produced a fair yield of grain. This statement was based largely on the tests of the year 1913-14, put down in Table X of Bulletin 161, which is abstracted in Table II of this bulletin.

TABLE II.—DATE OF SEEDING TEST ON DEAN WINTER RYE, S. D. NO. 177 AT HIGHMORE, 1914

| Date of seeding | Yield of grain Bushels per acre | Straw cwt. per acre | Weight per bushel |
|--------------------|---------------------------------|---------------------|-------------------|
| September 1 | 25.2 | 42.6 | 53 |
| September 15 | 27.1 | 47.5 | 53 |
| October 1 | 26.6 | 47.8 | 53 |
| November 1 | 20.6 | 42.9 | 53 |
| March 1 | 14.7 | 31.4 | 52 |
| March 15 | 8.8 | 21.5 | 52 |
| April 1 | 5.9 | 15.2 | 50 |

The statement that winter rye may be seeded as late in the spring as March 1 and still produce a fair crop should be accurately interpreted; it simply means that the preeminent hardiness of rye as a cereal permits it to withstand conditions and make growth enough to produce reasonable yields even when it is seeded much later than the optimum date. It may well be emphasized that the optimum date for seeding winter rye under conditions at Highmore is September 15. This is in accord with the tests made in a single year when Dean winter rye was seeded at Highmore Experiment farm on seven different dates extending from September 1 to April 1. The highest yield resulted from the seeding of September 15 with practically the same yield resulting from October 1; yields from later seedings were found to be regularly smaller as the date of seeding grew later.

The yield from the seeding of November 1, however, amounted to as much as 20.6 bushels, while that of March 1 (practically a spring seeding of winter rye) amounted to 14.7 bushels per acre. Even later spring seedings yielded something; that of April 1 produced nearly 6 bushels per acre.

The indications from this single year are that the winter rye crop should be seeded at the optimum date of September 15 under Highmore conditions. However, the crop is dependable when seeded at later or earlier dates. These conclusions have been substantiated by yields of eight more recent years.

TABLE III.—YIELDS FROM WINTER RYE, SEEDED AT HIGHMORE EXPERIMENT FARM, AT SUCCESSIVE DATES

| Date of Seeding | Yields of grain in bushels (56 lbs.) per acre from seeding at given date in given year | | | | | | | | | | Ave. Nine Years | Ave. Eight Years |
|-----------------|--|------|--------|--------|------|------|------|------|------|------|-----------------|------------------|
| | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | yrs. | | |
| July 15 | 26.8 | 36.6 | Destr. | Destr. | 19.2 | 33.9 | 7.1 | 37.5 | 9.8 | 19.0 | 16.8 | |
| August 1 | 31.8 | 38.4 | by | hprs. | 23.7 | 41.9 | 4.2 | 42.8 | 8.5 | 21.3 | 19.1 | |
| August 15 | 37.1 | 35.7 | hprs. | 5.3 | 21.4 | 48.2 | 2.9 | 41.1 | 8.0 | 22.2 | 20.5 | |
| September 1 | 39.8 | 29.4 | 18.5 | 9.8 | 21.4 | 49.1 | 2.7 | 42.0 | 11.6 | 24.9 | 24.4 | |
| September 15 | 51.8 | 36.6 | 27.2 | 17.8* | 20.1 | 40.2 | .9 | 38.4 | 6.2 | 26.6 | 25.3 | |
| October 1 | 42.8 | 41.1 | 26.3 | 21.4 | 18.3 | 37.5 | 2.7 | 38.4 | 12.5 | 26.8 | 25.0 | |
| October 15 | 25.0 | 42.0 | 25.0 | 17.0 | 7.6 | 35.7 | 1.1 | 32.7 | 12.5 | 22.1 | 19.6 | |
| November 1 | 32.1 | | 16.6 | Killed | 8.5 | 33.9 | 1.1 | 39.0 | 13.6 | | 18.1 | |
| November 15 | 33.9 | | 15.3 | out | 6.2 | 33.3 | .7 | 42.8 | 13.6 | | 18.2 | |
| December 1 | 33.9 | | | " | 8.5 | 25.0 | .0 | 41.1 | 12.5 | | 17.3§ | |

*Yield taken from variety test plot.

§Seven year average.

Table III indicates that under ordinary conditions the optimum time for seeding winter rye should be emphasized; nevertheless in the presence of drought or under other temporarily unfavorable conditions, the time of seeding need not be considered absolutely the determining factor so far as securing a reasonable crop is concerned. In other words, seeding winter rye may be delayed upon certain occasions appreciably after the optimum date of seeding.

The average yields, as reported in Table III, show that reductions in yield from seeding at dates earlier than the optimum were approximately equal to reductions from seeding later. Likewise the reductions vary gradually with the removal of the dates either way from the maximum time of seeding. Whatever may be the cause of variation from the optimum, apparently it reduces the yield of rye. Nevertheless, winter rye due to its hardiness, is able to adjust itself measurably to such conditions. This makes it possible, if not advisable, to delay seeding for rain-fall or until optimum conditions are approached in other respects. For example, the average yields indicate that in case soil moisture is very limited in a given locality on the optimum date for seeding rye, September 15, it would be safer so far as conservation of seed is concerned to delay seeding at least until October 1 and possibly later in order to be certain that ample fall rains would come.

In two separate years, 1919 and 1920, the earliest fall seedings were destroyed by hoppers which may be one objection to seeding at these earliest dates. The record also indicates that the latest seedings, those after November 1, killed out in a single year, 1920, although no yields in any year of seedings as early as October 15 killed out.

SUMMARY

The position of winter rye as a well established crop in South Dakota is indicated by the fact that substantial acreages are sown each year.

Such position for winter rye results from the fact that it is a comparatively sure crop, capable of producing fair yields when seeded over wide range of time and conditions.

Yields from seeding at different dates at the experiment substation at Highmore indicate that under usual circumstances maximum yields can be secured from seeding at the optimum date, September 15.

In seasons when rainfall is abnormally high or abnormally low the safest method of handling seed of winter rye would be to delay seeding for some weeks after the optimum date until conditions are favorable. This delay in seeding winter rye in order to avoid possible loss of valuable seed is warranted on the basis of fairly good yields secured from later seeding.