

to prepare western north dakota stubble land
for small grain, DICKINSON experiment
station compares—

Spring plowing with Fall plowing

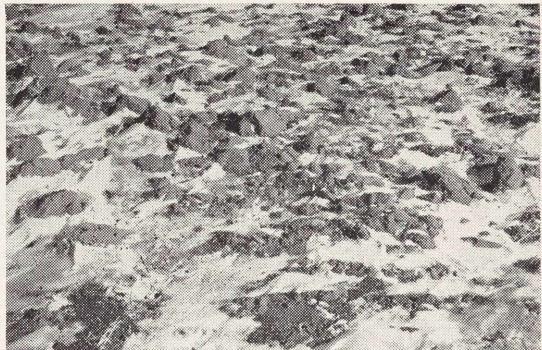
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THE harvest of this year's continuous cropping experiment at the Dickinson Experiment Station completed a half century of trials comparing spring plowing with fall plowing for small grain production in western North Dakota.

A comparison of average yields from this trial shows that spring plowing has produced 1 bushel per acre more wheat, 2.1 bushels per acre more oats and 1.3 bushels per acre more barley than fall plowing for the entire 50 year period.

Another interesting comparison between these two tillage methods is found in table II.

Figure 1.—Snow pack in the spring plowed plot of the continuous wheat series, Dickinson Experiment Station. The additional moisture saved by retarding drifting snow and holding it in place has provided moisture for germination and early crop growth. It has been an important factor in producing higher yields on spring plowing in the Dickinson trials.—(Photo by Larkin Langford.)



Summary

With wheat and oats, spring plowing has been a better producer than fall plowing twice as often during the past 50 years. With barley, spring plowing has been better than fall plowing one and one-half times as often.

An average of all three crops shows that during the past 50 years:

(1) Yields from spring plowing exceeded yields from fall plowing by at least 1 bushel per acre 51 percent of the time.

(2) Yields were equal for both tillage methods 12 percent of the time.

TABLE I.—Annual Yields of Wheat, Oats and Barley Produced in the Continuous Cropping Experiment at Dickinson 1907-1956, Inclusive.

	Wheat—bus. per acre		Oats—bus. per acre		Barley—bus. per acre	
	SP	FP	SP	FP	SP	FP
1907....	37.0	31.6*	49.4	55.8	45.8	47.7.
1908....	24.3	17.7*	48.4	32.8*	33.5	24.0*
1909....	26.8	25.2*	55.9	58.4	39.8	39.0
1910....	17.4	18.2	32.0	26.0*	28.3	31.1
1911....	5.7	1.4*	6.6	1.6*	9.6	1.2*
1912....	0.0	0.0	0.0	0.0	0.0	0.0
1913....	13.5	20.5	33.0	44.4	19.2	34.8
1914....	10.5	8.9*	15.3	14.4	25.0	20.2*
1915....	25.8	28.7	55.6	86.6	49.0	59.4
1916....	16.7	21.0	41.3	54.7	23.6	29.8
1917....	5.5	2.7*	7.2	9.1	8.1	5.4*
1918....	3.5	7.3	0.9	6.6	2.9	3.5
1919....	0.0	1.3	0.0	0.5	1.3	1.8
1920....	15.6	12.8*	38.7	15.3*	31.5	19.1*
1921....	3.9	2.6*	0.0	0.0	7.6	0.0*
1922....	23.5	19.7*	69.4	60.2*	38.7	35.5*
1923....	10.3	12.3	38.8	33.8*	24.8	22.3*
1924....	18.0	15.3*	49.4	40.3*	21.9	16.7*
1925....	4.5	7.0	16.6	11.6*	9.0	6.5*
1926....	0.0	0.0	0.0	0.0	0.0	0.0
1927....	11.8	13.0	44.4	45.3	23.3	27.3
1928....	12.5	15.0	38.4	41.6	18.1	19.6
1929....	10.2	8.3*	21.3	12.8*	7.1	7.9
1930....	7.3	5.0*	18.8	17.8*	21.9	20.2*
1931....	1.0	1.2	0.0	0.0	0.6	0.6
1932....	15.7	13.7*	29.7	26.9*	22.9	26.3
1933....	1.8	0.8*	8.1	2.5*	4.6	6.0
1934....	1.3	0.0*	10.0	2.2*	3.8	1.3*
1935....	13.5	7.2*	31.6	11.9*	25.0	13.1*
1936....	0.0	0.0	0.0	0.0	0.0	0.0
1937....	10.0	5.3*	5.9	2.8*	11.9	5.6*
1938....	4.3	6.5	10.0	16.3	8.5	12.7
1939....	17.0	22.5	58.1	61.9	40.0	40.8
1940....	8.7	4.5*	13.4	8.8*	19.0	9.0*
1941....	12.3	11.5	15.0	15.9	9.4	10.6
1942....	28.7	37.2	58.1	60.3	34.4	36.5
1943....	17.8	17.2	48.4	43.8*	24.0	27.1
1944....	20.2	19.2*	51.6	44.1*	19.2	17.3*
1945....	13.2	16.0	31.9	36.9	15.4	17.5
1946....	9.3	2.7*	20.3	6.6*	9.8	3.8*
1947....	15.0	11.8*	37.2	38.1	21.5	23.8
1948....	21.7	19.5*	31.6	29.1*	22.3	18.3*
1949....	3.2	2.7	13.8	8.1*	7.7	1.5*
1950....	14.5	8.7*	30.6	23.1*	19.4	12.9*
1951....	13.7	13.0	33.8	33.8	28.1	29.2
1952....	7.5	9.2	16.9	20.0	12.6	16.1
1953....	15.8	14.6*	37.8	31.6*	27.1	23.7*
1954....	9.0	4.5*	25.3	13.1*	15.9	6.5*
1955....	21.5	12.2*	35.9	28.8*	20.8	15.6*
1956....	2.1	0.0*	3.1	0.0*	0.0	0.0
Total....	603.1	557.2	1339.5	1236.2	913.9	848.8
Average	12.1	11.1	26.8	24.7	18.3	17.0

*Years when yield of spring plowing exceeded yield of fall plowing by at least 1 bushel per acre.

Figure 2.—Fall plowed plot in the continuous wheat series at the Dickinson Experiment Station taken on the same day as Fig. 1. In addition to holding less snow in the winter, fall plowed land is more subject to wind erosion for 6 to 7 months from time of plowing, usually in September, to seeding time, usually the first part of April.—(Photo by Larkin Langford.)



(3) Total failure for both tillage methods was recorded 9 percent of the time.

(4) Yields from fall plowing exceeded yields from spring plowing by at least 1 bushel per acre only 28 percent of the 50 years since 1907.

Fall plowing is no longer an important tillage practice on grain stubble land in western North Dakota. Fifty years ago, when these trials were begun, plowing was a much slower operation than it is today. Fall plowing was done to enable the early seeding of larger acreages of small grain in the spring. In later years use of tractors and high speed plows, and the increased use of the combination plow-packer-press drill for a once-over seeding job, have speeded up seeding operations so that large acreages can be handled satisfactorily in the spring. This, plus the fact that yield trials have shown higher yields from spring plowing compared with fall plow-

ing, rules out fall plowing of stubble land as a tillage practice for western North Dakota farms, except on local areas where gumbo or heavy clay soils make fall plowing necessary to enable the early seeding of the land in the spring.

Why spring plowing is recommended in western North Dakota:

- 1** Standing stubble traps snow to help provide moisture for germination and early growth.
- 2** Standing stubble protects the land from wind and water erosion over winter.
- 3** Seeding operations with a plowpacker and press drill are more economical than are the two separate operations required when fall plowing is practiced.

TABLE II.—Summary of the Number of Years in the Period 1907-1956 When There Was at Least a 1 Bushel Per Acre Difference in Yield Between Spring Plowing and Fall Plowing in the Continuous Cropping Experiment at Dickinson.

	Wheat	Oats	Barley
Spring plowing better than fall plowing.....	27 years	26 years	23 years
Spring plowing equal to fall plowing.....	6 years	5 years	7 years
Both spring plowing and fall plowing failed...	3 years	6 years	5 years
Fall plowing better than spring plowing.....	14 years	13 years	15 years
Total.....	50 years	50 years	50 years

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