THE EFFECT OF SOIL TREATMENT IN STABILIZING
YIELDS OF WINTER WHEAT

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The hazards of crop production are many and either failure or
overproduction of a given crop may cause great inconvenience
and loss to farmers and to the entire nation.

The purpose of this paper is to point out the effect of soil treatment
upon the regularity or stability of winter wheat production over a
period of years and on numerous different soil conditions in Illinois.

SOURCE OF DATA

The crop yield data used in this study were secured from the soil experiment
fields operated by the Illinois Experiment Station, most of which were established
during the years 1910-15. The crops included in the discussion are those of the 15-
year period ending in 1935, hence, the plats were well established by several
years of preliminary cropping prior to 1919, the first season from which data are
used. A few substitute crops have been grown where failure was almost complete
and these were omitted from the averages. Whenever such omissions were made,
the results of an earlier season were used to complete the 15-year sample. The
fields were laid out so that each crop of the rotation used was represented each
year. Most of the harvests were made from plats one-tenth acre in size. A few fifth-
acre and a few twentieth-acre plats were used.

SOIL TREATMENT

Plats 1, 5, and 10 in each series are untreated. Plats 2, 3, and 4 receive animal
manure usually once during each 4-year rotation in amounts equal in weight to
the crops removed. Plats 6, 7, 8, and 9 are residue plats receiving additions of
organic matter in the form of cornstalks, second growth clover, and a legume
catch crop (usually sweet clover) wherever it can be conveniently used in the rota-
tion. Applications of limestone are made as needed to plats 3, 4, 7, 8, and 9 (called
the limed plats) and generous applications of rock phosphate were made to plats 4,
8, and 9 (the phosphate plats). Potash is regularly used on plat 9. Expressed
the usual symbols the soil treatments on the entire series on all fields have been as
follows: Plat 1, check; plat 2, M; plat 3, ML; plat 4, MLP; plat 5, check; plat 6, R;
plat 7, RL; plat 8, RLP; plat 9, RLPK; and plat 10, check.

EXPERIMENTAL RESULTS

Winter wheat yields for the 15-year period ending in 1935 have
been studied on 18 soil experiment fields in Illinois located as indi-
cated on the map (Fig. 1). They represent a range of latitude of more
than 300 miles and include many distinctly different soil conditions.
The plats were established primarily to study the merits of the soil
treatment systems as they affected crop yields and economical use of

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2Associate and Chief in Soil Experiment Fields, respectively.
3Yield data published in Illinois Experiment Station Bulletins 273, 280, 296,
305, 327, 347, 370, 382, 398, 402, and 425.