

Kansas State Agricultural College

EXPERIMENT STATION

DEPARTMENT OF AGRONOMY



Injury to Wheat and Other Crops by Freezing and Heaving of the Soil

Reports from several localities in the State indicate that winter wheat, other winter grain, alfalfa and other crops are being injured by the freezing and heaving of the soil. This heaving results from the alternate freezing and thawing of very wet ground. Certain types of soil which contain considerable clay and hold water are more subject to heaving. Often the whole furrow slice is lifted, doubtless due to the fact that the water tends to accumulate at the bottom of the mellow soil and freezing lifts the soil above; also the cleavage line may be nearer the surface. The lifting of the soil by freezing breaks the roots of the wheat and other plants which may be growing on such land. When the soil thaws it tends to settle, leaving the upper parts of the plant roots exposed above the ground, and the continued alternate freezing and thawing gradually draws the plant roots out of the soil.

As long as the ground is very wet and the alternate freezing and thawing continues, nothing can be done to stop the heaving. As soon as the frost goes out and the ground becomes dry enough some benefit may result from rolling—by settling the soil and pressing the soil more firmly about the loosened roots. A heavy, smooth roller is preferred for this work. It is not advisable to harrow wheat which has been injured by heaving, since the harrowing is likely to pull out many of the plants and still further loosen the roots of those which remain.

It is almost impossible to prevent injury by heaving in certain heavy, waxy types of soil. Well-drained land is not thus affected, and even in ground which is subject to heaving it may be largely prevented by good surface drainage and very careful preparation of the seed-bed. The seed-bed which is prepared late and left in a loose, mellow condition, especially if some trash or manure has been plowed under, is much more apt to heave than the finely pulverized, well-settled seed-bed. If the plowing precedes the planting by a long interval, so that the soil becomes settled and a good union is established between the furrow slice and the subsoil, then the heaving is much less apt to occur.

It has been shown by the experiments at this Station that the careful preparation of the seed-bed by early plowing and sufficient surface cultivation so as to pulverize and settle the soil results in largely increased yields. It is doubtful whether the injury by heaving to wheat or other grain which is now occurring in some fields in certain localities in the State can be prevented or remedied to any extent. Timely rolling may help a little as suggested above. But this damage to the crops may be a lesson to the farmers so that they may in future plantings take greater precaution in putting the soil in the best possible seed-bed condition before planting the crop.

Approved:

ED. H. WEBSTER,
Director.

MANHATTAN, KAN., Feb. 14, 1910.

A. M. TEN EYCK,
Agronomist.