

The perennial plants, among which the native quack, sweet grass and prairie rose are the most common, are serious pests in many stubble fields. They spread not only by seeds but by underground creeping rootstocks. These weeds cannot be controlled by burning or discing or other surface cultivation. Ploughing, preferably in dry seasons, when the roots can be exposed to the hot sun and drying wind, is the only remedy for these legacies of poor breaking. Other plants of a similar nature are brome grass, Canada thistle and sow thistle.

#### THE "SEEDBED."

A good seed bed is one that provides the conditions necessary for germination—heat, air and moisture—in optimum amounts, at the right depth at the time the seed is sown. Too often the surface of our stubble fields is too hard to get the seed into or too dry to cause germination or covered with stubble through which the drill cannot satisfactorily force the seed. The surface soil can be made more mellow by surface cultivation or by ploughing; the moisture content can be more or less controlled by the same means, and the stubble, if too long, can either be burned or ploughed under deeply or left without any cultivation.

#### IMPORTANCE OF "AVAILABLE" PLANT FOOD.

All of the plant food in a soil cannot be drawn upon by the growing crop. Since plants "drink" their food it is clear that only that portion of the fertilising constituents in the soil that becomes soluble can be used by them. It is a wise provision of nature that only a very small proportion of the total plant food in a soil becomes available or soluble in a year, otherwise the present holders of land would quickly dissipate its stores of wealth and succeeding generations would starve. The agencies causing the breaking down of plant food constituents in the soil are more or less dormant during our dry autumns and long winters, with the result that the amount of available plant food in stubble fields is relatively small. Under our climatic conditions the quantity is increased—and with it the yield of crops—by any form of tillage that does not waste soil moisture.

The more "available" plant food there is in a soil the less moisture is required to produce a bushel of wheat. In stubble fields the amount of moisture is very low at best, and we cannot increase the supply materially. But we can make better use of what we have by giving it opportunity to carry into the plant a more dense solution, a larger load, a richer "soil soup."

#### STUBBLE—A NUISANCE—YET IMPORTANT.

The stubble of cereal crops is made up of elements derived by the plant from soil and air. If stubble is burned the most valuable fertilizing element secured from the soil, viz., nitrogen, passes off into the air. The burning of stubble dissipates "organic matter," the constituent that helps to keep soils from blowing, the one that increases the water holding capacity of the soil and at the same time makes it easier to work. The amount of this constituent in decayed form in a soil is the greatest single index to its "fertility."

But stubble lessens the efficiency of tillage and seeding operations, and long stubble if ploughed under may seriously interfere with the upward movement of soil moisture from the subsoil, thus lessening the