FERTILIZERS sometimes injure crops by reducing the stand or by retarding the development of established plants. This effect is known as “burning” because firing or scorching of the leaves of the plants is often a symptom of such injury. The injury is due, in part, to a very high osmotic pressure in the soil solution of the plant root zone. This may be caused by the use of certain fertilizers especially when they are placed under or too close to the seed.

Fertilizers of the same analysis may vary 4 to 5 fold in their effect on the osmotic pressure of the soil solution. This effect then does not depend on the amount of plant nutrients in the fertilizer but rather on the carriers that are used to supply the plant nutrients. For example, potash supplied in the form of 17.5% kainit may, per unit of potash applied, increase the osmotic pressure over 3 times as much as 60% muriate of potash. Similarly, potash supplied as 30% manure salts may increase the osmotic pressure 1.6 times as much as 60% muriate. In the manufacture of high analysis fertilizers it is usually difficult to put the desired amount of plant food into the mixture unless high analysis materials are used, but in low analysis fertilizers this difficulty is not experienced. Low analysis materials such as kainit can be used in low analysis mixed fertilizers because smaller amounts of plant food are put in each ton. Hence low analysis fertilizers tend to contain more salt per unit of plant food. This when dissolved in the soil moisture causes burning.

The salt index of fertilizers (4, 6)\(^3\) affords a means of expressing differences in the probable effects of different fertilizers or fertilizer