

The atom's expanding role in agriculture

With the world's population expected to double by the end of the century, the farmer's burden will double also. By the year 2000 he will be expected to furnish food for approximately seven billion people. To reach this goal he has to be a soil scientist, horticulturist, agronomist, and plant physiologist, as well as a businessman. Assisting him has been the research scientist, who has provided important advances in plant breeding, soil study, irrigation, livestock production, and food preservation. As a result, food production is rising, and losses from insects, plant diseases, and spoilage, which total billions of dollars annually, are being substantially reduced.

Neither the agricultural expert nor any other scientist has so far solved the primary problem of the age—population control. What agriculture has done, with an important assist from nuclear energy, is to buy time by keeping the rapidly expanding population fed while other sciences pursue methods to check a population that is growing faster than the world's resources.

In any attempt to develop new and better crop varieties, the basic problem narrows down to a manipulation of genetic material, a kind of genetic engineering.

New crops through mutations

Ever since the pioneering work of H. J. Muller in 1927, radiation has been known to significantly increase variability in living things by inducing mutation. Although most induced mutations are deleterious, a number can offer advantages. An important application of this is plant breeding for better crop strains. The plant breeder, in addition to using the more conventional techniques of selection and crossing, can now expand the available genetic inventory for his work by using radiation to enhance variability in the crop.