

1.2: Chemistry in Agriculture

In the spring, many people begin to plant their gardens. They see ads in catalogs or shop the gardening section of a local store to get ideas. The right place in the garden is selected, seeds or plants are put in the soil, and then they wait. Whether it is a small home garden or a large thousand acre farm, chemistry contributes greatly to the success of the crop.

Agriculture

Crops need three things for good growth: **water**, **nutrients** from the soil, and **protection** from predators such as insects. Chemistry has made major contributions in all three areas. Water purification uses a number of chemical and physical techniques to remove salts and contaminants that would pollute the soil. Chemical analysis of soil allows the grower to see what nutrients are lacking, so that they can be added. In the spring, grocery stores, hardware stores, and gardening centers have high stacks of bags containing fertilizers and weed killers that enrich the soil and keep down unwanted plants. These same stores also provide a number of sprays or solid treatments for insects that might otherwise eat the plants.



Figure 1.2.1: Idaho wheat field.

Water Purification

Fresh water is essential for good crops. In some areas of the world, there is enough rain to accomplish this task. In other locales, water must be provided so the crops will grow. Worldwide, irrigation covers about 18% of farm land and produces some 40% of crops. Obtaining clean water in many parts of the world is made possible by the process of **desalinization**.



Figure 1.2.2: Desalinization equipment.

Sea water is treated to remove salts and the resulting water can then be used for irrigation without contaminating the soil with materials that harm the growing plants.

Summary

- Sea water may be purified through the process of desalination.
- Plant nutrients are very important for good plant growth.
- Chemical analysis of soil can tell a farmer or gardener what nutrients the soil needs.
- Chemists have developed many pesticides that will kill plant predators such as the army worm and the boll weevil.

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