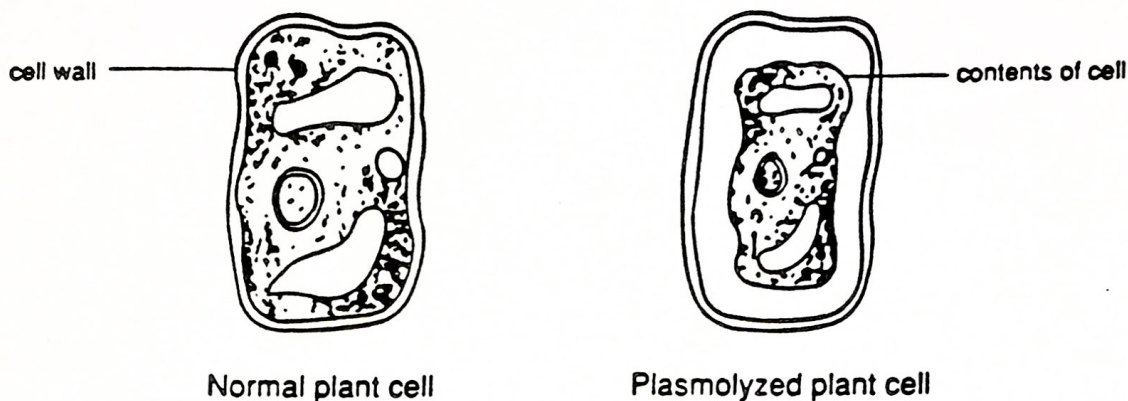


# Halophytes

Usually when a plant is grown in salty soil, water in the root cells diffuses out. When this happens, the cells plasmolyze; that is, the contents of the cells shrink away from the cell wall, as shown in the diagram. As a result, the plant withers and eventually dies. However, plants called *halophytes* can tolerate and grow in soils too salty for other plants.



Halophytes survive in salty soil because they can concentrate salt in their root cells. The high salt concentration keeps water from diffusing out of the cells into the surrounding salty soil. Also, halophytes are able to get rid of excess salt. Some secrete salt through their roots. Others have glands on their leaves and stems that secrete the excess salt. The salt forms a crusty coating, which eventually drops off.

Agricultural scientists are interested in halophytes that can be grown as crops. For example, they have discovered a halophyte called *salicornia* from which vegetable oil can be extracted in large quantities. Another halophyte called *atriplex* can be used as animal feed. These halophytes can be grown in areas where the salty soil is usually unsuitable for raising crops.

Scientists are also using breeding techniques to produce new strains of salt-tolerant plants. They have developed salt-tolerant beets, barley, and tomatoes. More salt-tolerant plants are expected to be developed in the future.

## Answer in complete sentences:

1. Define Plasmolyze. Draw a plasmolyzed plant cell. Highlight/color the cell wall green and the membrane yellow.
2. How might halophytes be important in agriculture?
3. Read the following question from a reader sent to the Home & Garden section of the Raleigh News & Observer in February 2014:

*Q: Dear Ed, In the 3 years that I have lived in North Carolina (I am a Florida native), I have had several shrubs and bushes planted along the road in front of my house. This gives me more privacy as it screens my view of a major road. It has always been nice to have a noise buffer when large trucks drive by like the noisy Department of Transportation salt trucks this winter. All three years my plants have been fine and thrived. I made sure to plant shrubs and bushes that would survive a North Carolina winter. They are evergreen and usually look lovely. This year however they are turning brown, wilting and several have died. Do you think it is because of all the snow and extra cold temperatures? What should I do?*

*Winter Botanist*

Use your knowledge of osmosis and diffusion as well as the article information to answer this person's question. Remember to give explanations and tips/suggestions. Write your answer in the form of an advice column response.