

Biology

The effect of salinity on crop plant (grass) germination and on seedling

Background

Salination of soil can have an impact on crop production in many parts of the world. Salination may be due to natural causes or human activities such as irrigation, land-clearing, or substituting perennial crops with annual ones.

Some crops are more salt-sensitive than others. Students can investigate the salt-sensitivity of different crops (rice, wheat, barley), or they can investigate the salt-sensitivity of different strains of the same crop species (e.g. different strains of wheat). Germination rates and seedling growth can be used as an indicator of salt sensitivity.

You will need...

- ✓ Petri dishes (or other suitable containers)
- ✓ Cotton wool or filter paper
- ✓ NaCl solutions (0.2%, 0.5%, 1.0%, 1.5%, 2.0%, 2.5%, 3.0%)
- ✓ Crop plant seeds (rice, wheat, barley, canola etc.)

Follow these steps

1. 10 to 20 seeds are placed in each Petri dish on cotton wool or filter papers are placed in Petri dishes with 7 to 10 ml of different concentrations of salt.

2. Petri dishes are allowed to germinate over a period of days.
3. Seeds are observed daily to check for germination.
4. Time to germination is recorded as well as numbers of seeds germinating, at each concentration.
5. Growth rates of seedlings can then be monitored over time by measuring seedling length and calculating averages per plate.

So what happened?

Rice is generally more sensitive to salt than other crops.

What next?

Salt-tolerance of different barrier grasses planted in sand dunes to prevent coastal erosion can be investigated.

