

- Plants are more likely to survive if they respond to the pressure of predators to avoid being eaten:
  - White clover is a plant that can produce substances that are toxic to cattle. Cattle start to eat the clover when field overgrazed.
- Plants are more likely to survive if they respond to antibiotic stress – anything harmful that's natural but non-living:
  - Carrots produce antifreeze proteins at low temperature – the proteins bind to ice crystals and lower the temperature that water freezes at, stopping more crystals growing.

### Auxins:

- Auxins are plant hormones which control growth at the tips of shoots and roots. They move through the plant in solution.
- Auxin is produced in the tips and diffuses backwards to stimulate the cell elongation process which occurs in the cells just behind the tips.
- Auxin promotes growth in the shoot, but actually inhibits growth in the root.
- Auxins are involved in the growth responses of plants to light and gravity.
- Shoots are positively phototropic.
  - When a shoot tip is exposed to light, it accumulates more auxin on the side that's in the shade than the side that's in the light.
  - This makes the cells grow faster on the shaded side, so the shoot bends towards the light.
- Shoots are negatively geotropic.
  - When a shoot is growing sideways, gravity produces an unequal distribution of auxin in the tip, with more auxin in the lower side.
  - This causes the lower side to grow faster, bending the shoot upwards.
- Roots are positively geotropic.
  - A root growing sideways will also have more auxin on its lower side.
  - But in a root the extra auxin inhibits growth. This means the cells on top elongate faster, and the root bends downwards.

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