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Turning up heat on plants could help grow crops of the future

Crops that can thrive in warming climates are a step closer, thanks to new insights into how temperature and light affect plant development.

Warm temperatures have important and unexpected roles in controlling how plants grow and when they flower, two separate studies have shown. The findings could aid the development of crops that can adapt to changing climates.

Scientists studied the effect of light and temperature on seedlings of a small cress plant known as *Arabidopsis*. They were surprised to find that at high temperatures, light causes seedling stems to develop in the same way that they normally would in shade or darkness.

This is the opposite of how plants behave at cooler temperatures, when light inhibits stem growth.

In a second study in the same cress plant, researchers gained new insight into how seasonal flowering is promoted by lengthening summer days and by rising temperatures. They created a mathematical model of the factors that control growth and flowering, and used this to predict plant behaviour, before validating their findings with experiments.

Researchers are not certain why temperature influences plants in these ways. They suggest that plants may associate hot weather with a risk of drought, and so grow and flower quickly to reproduce before they die.

The studies, published in *Nature Communications* and *Molecular Systems Biology*, were supported by the Biotechnology and Biological Sciences Research Council, the Natural Environment Research Council and the European Commission.

Dr Karen Halliday, of the University of Edinburgh's School of Biological Sciences, who led both studies, said: "In the past, scientists had paid little attention to the influence of temperature on plant growth, but now there is fresh focus on this influential environmental factor. Collectively, these findings could be valuable in breeding plants for warm climates and ensuring food security."

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