Plants have cells that function as a 'brain' and are able to PREDICT the weather in order to decide the best time to sprout.

The 'decision-making centre' in thale cress has cells that promote germination.

Relies on the same mechanism that tells our brains when we should move or not.

Groups of cells communicate with each other by moving hormones, study found.

Plants are much smarter than we give them credit for and even have tiny brains that decide the right moment to germinate, according to a new study.

Researchers have found a group of cells function as a 'brain' for plant embryos which can predict the weather and change their behaviour accordingly.

Previous studies have shown plants can hunt out water and even learn from bad experiences, just like animals.

Pictured is a high resolution 3D scan of a plant embryo (in green) and shown in red is the region of cells where the seed makes the decision when to germinate.
WHAT DID THEY FIND?

Scientists showed that a small group of cells within the plant embryo operate in a similar way to the human brain.

The 'decision-making centre' in a plant called Arabidopsis, or thale cress, contains two types of cell - one that promotes seed dormancy, and one that promotes germination.

These two groups of cells communicate with each other by moving hormones, an analogous mechanism to that employed by our own brains when we decide whether or not to move.

The scientists used mathematical modelling to show that communication between the separated elements controls the plant's sensitivity to its environment.

A plant's decision about when to germinate is one of the most important it will make during its life.

Too soon, and the plant may be damaged by harsh winter conditions; too late, and it may be out-competed by other, more precocious plants.

In a study published in the National Academy of Sciences (PNAS), scientists from the University of Birmingham have shown that a small group of cells within the plant embryo operate in a similar way to the human brain.

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Following this theory, they used a mutant plant where cells were more chemically linked - essentially enhancing communication between circuit elements - to show that germination timing depends on these intra-region signals.

‘Our work reveals a crucial separation between the components within a plant decision-making centre’, said lead author of the study, Professor George Bassel from the School of Biosciences at the University of Birmingham.
'In the human brain, this separation is thought to introduce a time delay, smoothing out noisy signals from the environment and increasing the accuracy with which we make decisions', he said.

'The separation of these parts in the seed 'brain' also appears to be central to how it functions'.

The separation of circuit elements allows for a wider variety of responses to environmental stimuli, researchers found.
The ‘decision-making centre’ in thale cress (pictured, stock image) contains cells that promote seed dormancy as well as germination.

The mathematical theory describing the brain’s function predicted that more seeds would germinate when exposed to varying environments, such as fluctuating temperatures, than to constant environments.
Scientists tested this theory in the lab and found exactly this behaviour.

‘Our work has important implications for understanding how crops and weeds grow,’ said Dr Bassel.

‘There is now potential to apply this knowledge to commercial plants in order to enhance and synchronise germination, increasing crop yields and decreasing herbicide use’, he said.