

Talking Trees

How Plants Communicate and What They Say

Some people think that plants grow better if you talk to them. A few even believe the plants talk back and that we just don't understand. It's silly, right? Well, yes and no. Plants don't listen or talk to us, but they do "talk" and "listen" to each other.

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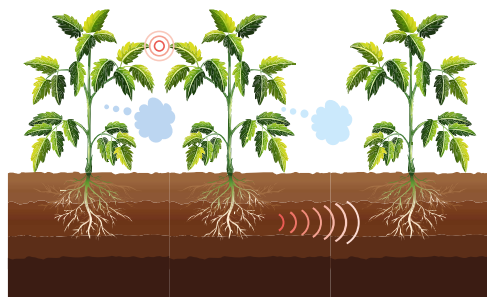
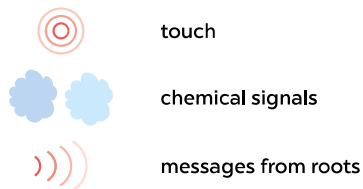
The idea that plant communication might be a real thing appeared in the 1980s. Scientists already knew that things like attacks by insects could change the way some trees grow. They also knew that sometimes the same changes happened on their own. They started to wonder: were these changes happening because *other* trees were being attacked? Could the trees be communicating with each other?

The Littlest Words

It didn't seem possible. Plants are just *there*. They don't think or move or feel pain. They certainly couldn't be talking. I mean, how would that even be possible?

We now know that plants do communicate, mostly by producing molecules that travel through the air or **soil**¹. Perhaps it shouldn't have been a surprise. The smells of flowers are chemical signals to **attract**² insects, and that's a kind of communication, too. Plant communication, it **turns out**³, is everywhere.

Basic Plant Communication



PEOPLE ARE REALLY SILLY!

OH, OUR POOR LEAFY COUSIN OVER THERE!

BUT HE DOESN'T NEED TO WORRY ABOUT WATER, THEY TAKE CARE OF HIM

Fighting Talk

We all know that plants have ways to fight off enemies. Some have **thorns**⁴ or **stings**⁵, and many are poisonous – they produce their own pesticides*. But thorns and stings don't help against insect attackers, and pesticides are "expensive": making chemical **weapons**⁶ uses energy and food that plants would rather use for growing. For this reason, many plants don't make them all the time. They start to do it only when their leaves get damaged.

What's interesting is that they also "tell" other plants to do the same. When they start up their chemical weapons factories, molecules get released into the air. Nearby plants **detect**⁷ these chemicals. They "know" that it means danger, and start making their own pesticides, too.

This can even cross between **species**⁸. When the leaves of a plant called sagebrush (= pelyněk) are damaged, it fills the air with a chemical that insects don't like. Tomato plants and tobacco plants nearby detect this chemical and start making their own anti-insect poisons. In another example, insect attacks on cucumber plants can "switch on" pesticide production in nearby chili peppers and lima beans.

PLANTS,
I'M COMING!

Call in an Air Strike⁹

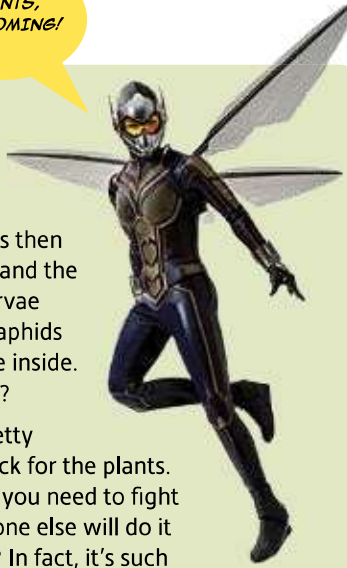
As any government knows, having your own military power is good, but having strong friends is even better. Some plants don't just make their own chemical weapons. They call for help from animals, too.

Everyone who has a garden has seen plants covered in **aphids**¹⁰. These are little vampire insects that attack plants and drink their blood (plant "blood" is called **sap**¹¹, really, but "blood-drinking" sounds more dramatic). It's hard for plants to fight them off.

Aphids have a number of natural enemies, though, especially parasitic wasps. So when aphids attack, the plants make chemicals that attract these wasps. The wasps **lay eggs**¹² inside the aphids.

The eggs then **hatch**¹³, and the wasp larvae eat the aphids from the inside. Nice, eh?

It's a pretty good trick for the plants. Why do you need to fight if someone else will do it for you? In fact, it's such a good trick that lots of plants use it. The lovely smell of fresh-cut grass, for example, is a chemical signal to attract parasitic wasps. How romantic.



Uses in Technology

These kinds of plant communication are not just cool. They may have practical uses, too. Farmers may be able to use them to make **crops**¹⁴ safer from insects. Think about making tomatoes safer from insect attack by using the warning signals from sagebrush leaves, for example, instead of spraying the plants with chemicals.

Even more advanced uses might be possible with genetic engineering. As we now know, plants can detect chemicals in the air and soil, then send signals to other plants. With genetic engineering, we

could "hack" this ability. Imagine a plant that could detect diseases or pollution in soil or water, then send out a chemical message in the air to tell us about it.



Does it sound like science fiction? Engineers at the Massachusetts Institute of Technology have already made spinach plants that can detect molecules from explosives. The future is here.

*Glossary

pesticide – any chemical used to kill an attacking species; pesticides include insecticides (which kill insects), fungicides (fungi), herbicides (plants) and many others.



CD Task



Listen to a recording about another type of plant communication and complete the notes.

- 1 Some plants send _____ between their roots.
- 2 Thin **fungi**¹⁵ around the roots _____ the plants like internet _____.
- 3 When scientists broke the fungi between some, the ones still connected fought against the _____.
- 4 The fungi have a special _____ with the plants. They are **allies**¹⁶ in the _____ against aphids.

Task

Decide if the following sentences are true or false. Correct the false ones.

- 1 Plants listen and talk to us.
- 2 Plants communicate by producing molecules.
- 3 Plants make pesticides when their roots are damaged.
- 4 Parasitic wasps are natural enemies of aphids.
- 5 Scientists have produced spinach plants that can make explosives.

→ SOLUTIONS IN THE TF

Vocabulary

- ¹ soil [sɔɪl] – zemina
- ² to attract [ə'trækt] – lákat
- ³ to turn out – ukázat se
- ⁴ thorn [θɔ:n] – trn
- ⁵ sting [stɪŋ] – žahavý chlup
- ⁶ weapon ['wepən] – zbraň
- ⁷ to detect [dɪ'tekt] – zaznamenat
- ⁸ species ['spi:ʃi:z] – druh, druhy
- ⁹ air strike ['eə streɪk] – nálet
- ¹⁰ aphid ['eɪfɪd] – mšice
- ¹¹ sap [sæp] – míza
- ¹² to lay eggs [leɪ] – snášet vajíčka
- ¹³ to hatch [hætʃ] – vylíhnout se
- ¹⁴ crop [krɒp] – plodina
- ¹⁵ fungi ['fʌŋɡaɪ] – houby
- ¹⁶ allies ['ælaɪz] – spojenci

