GOLD NUGGET

Plant 'telepathy' breakthrough:
We can't hear it, but scientists are finding that in the apparently silent world of plants, a whole lot of communication is going on. Part 2

"Because the presence and specific identity of neighbours influence germination timing and success, the existence of an adaptive mechanism that allows a plant to detect its neighbours (and potentially its forthcoming competitive environment), and hence to regulate its developmental responses accordingly at the very onset of its life (i.e. seed stage) is clearly advantageous."
How this works remains a mystery, although Dr Gagliano theorises that "nanomechanical oscillations of various components in the cytoskeleton can produce a spectrum of vibrations" - basically, seeds produce nano-sounds detectable by other seeds.

Less mysterious, but of great significance, is the discovery by UK researchers from several universities of an Avatar-like signaling network broadcast through mycorrhizae. These fungi form a symbiotic relationship with plant roots. In exchange for compounds the plant makes during photosynthesis, mycorrhizae transports nutrient and moisture through its vast networks of hyphae to the host plant.

In this sense, the fungi act as root extenders, often doubling or more the reach of a plant's roots. Many Australian trees can't thrive in Australia's poor soils without them.
American mycorrhizae specialist Dr Jim Trappe, a regular visitor here, speculates that widespread Australian tree dieback is a result of mycorrhizae networks being killed off by fertiliser and soil compaction on farmland.

The UK research shows that the fungal networks also form an underground communications network. The researchers used plots of broad beans, with each plant covered with a bag so it wasn't possible for the beans to communicate with chemicals released into the air. Some plots were connected through mycorrhizal networks; in others, the fungi weren't allowed to grow. When aphids were introduced to one of the mycorrhizae-connected bean plants, the levels of defensive chemicals in bean plants on the same fungal network quickly rose. In the unconnected beans, introducing aphids to a plant provoked no response in other plants.

John Pickett of Rothamsted Research told the BBC that one possible use for this knowledge would be to include particularly aphid-prone sacrificial plants in a crop. When aphids attacked, the fungal signaling system could raise the natural defences of more economically valuable plants. It could prove a robust method of switching on plant defences when needed - without demanding the plant produce defensive chemicals all the time - and reduce development of resistance, Professor Pickett said.

Farming Secrets says: Science at last is catching up with the secrets of nature

Ref: Matthew Cawood p18. The Land 23 May, 2013
- Love thy neighbour: facilitation through an alternative signalling modality in plants

See also The Secrets Life of Plants by Peter Tomkins & Christopher Bird
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