

# Plant communication. How it works



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CO<sub>2</sub>  
Photosynthesis

On the surface: emission of volatile organic compounds. These volatiles attract enemies of the herbivores, that is, organisms of the third trophic level (predators, parasitoids).

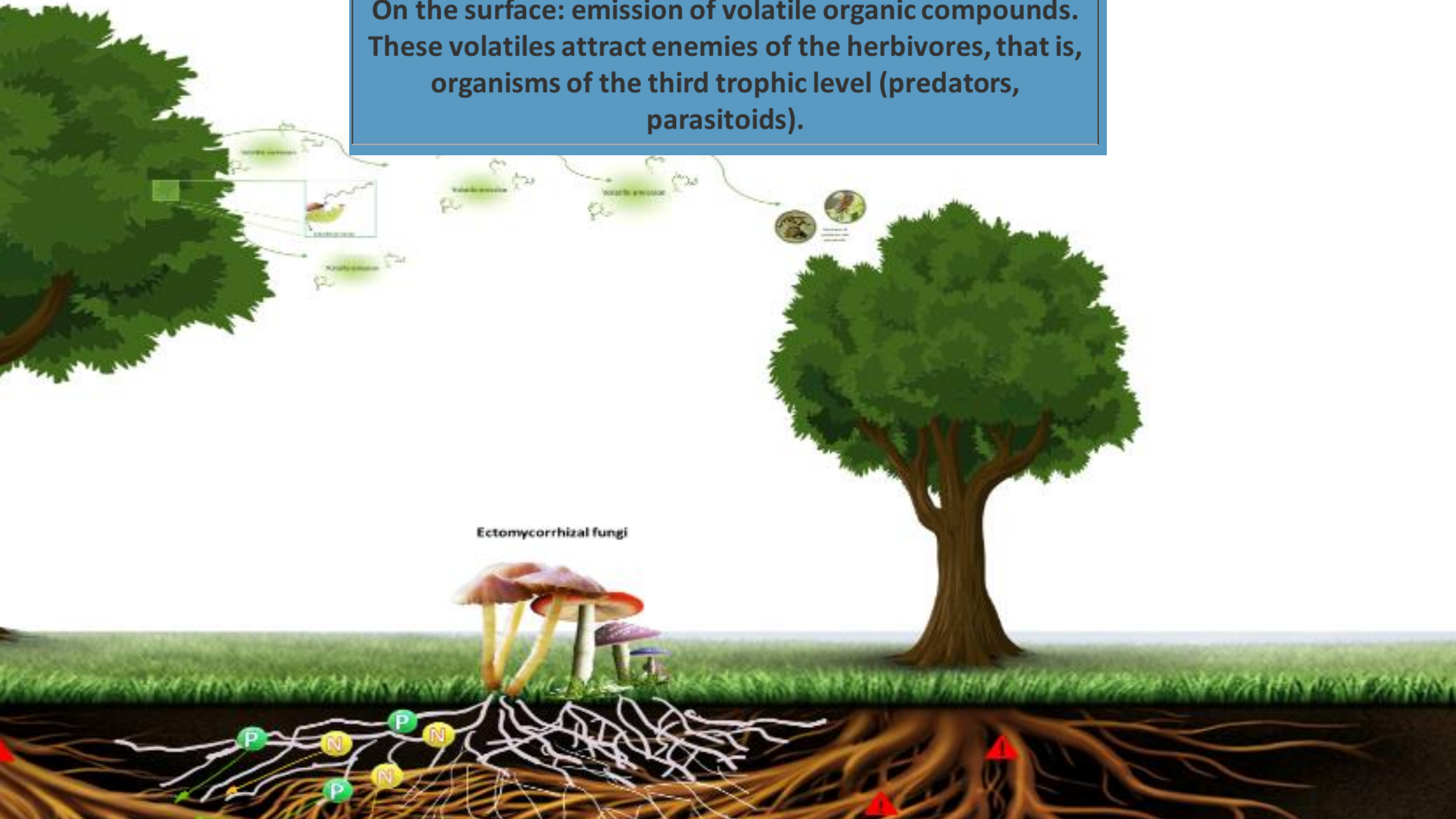
Ectomycorrhizal fungi

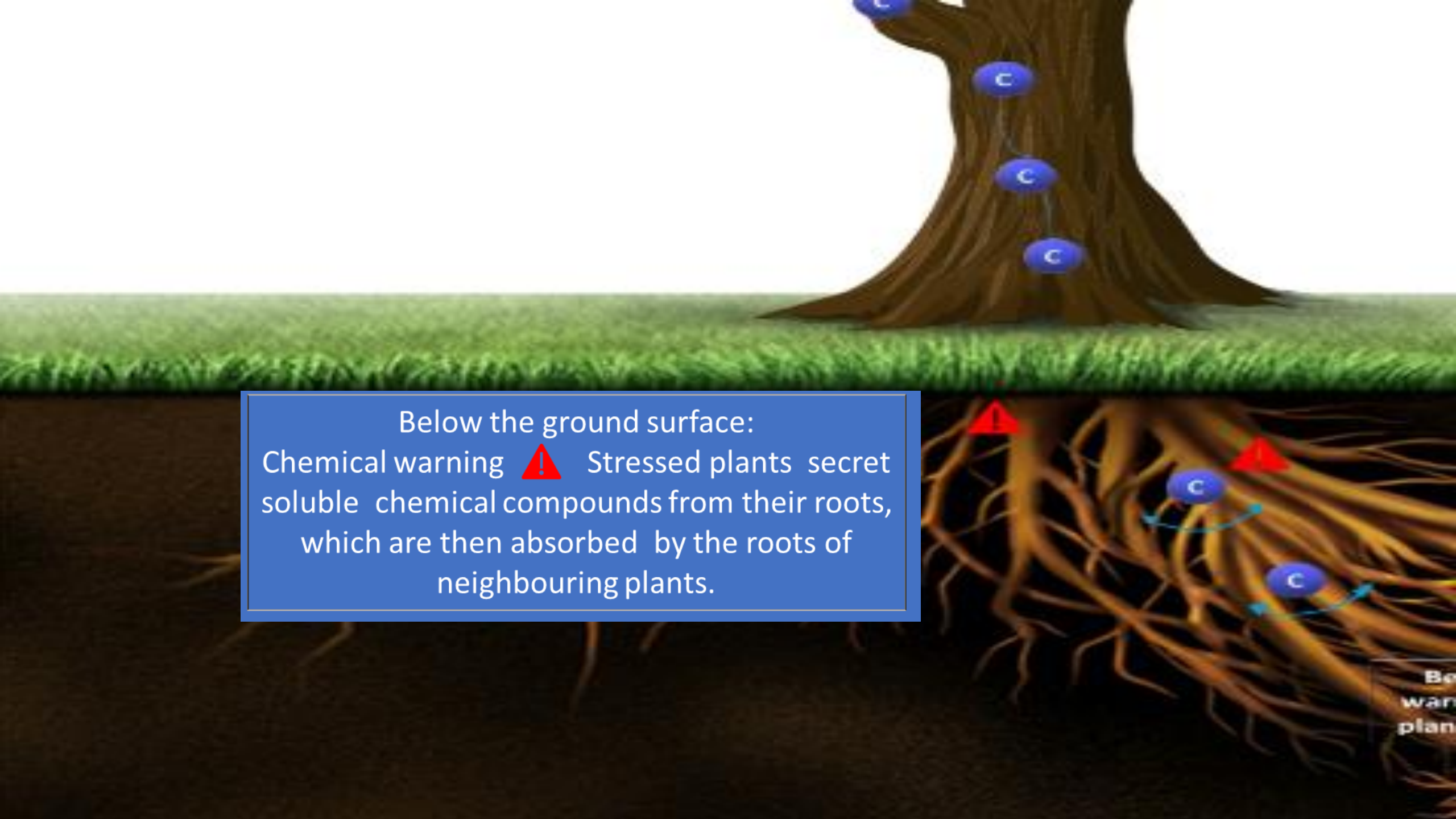
Below the ground surface: Chemical warning. Stressed plants secrete soluble chemical compounds from their roots which are then absorbed by the roots of neighbouring plants.

Below the ground surface: also transmit warning signals via the thin thread of fungi plants that connect their roots from the soil

Below the ground surface: hub trees use the mycelium network to provide food to other trees, from the same or different species.

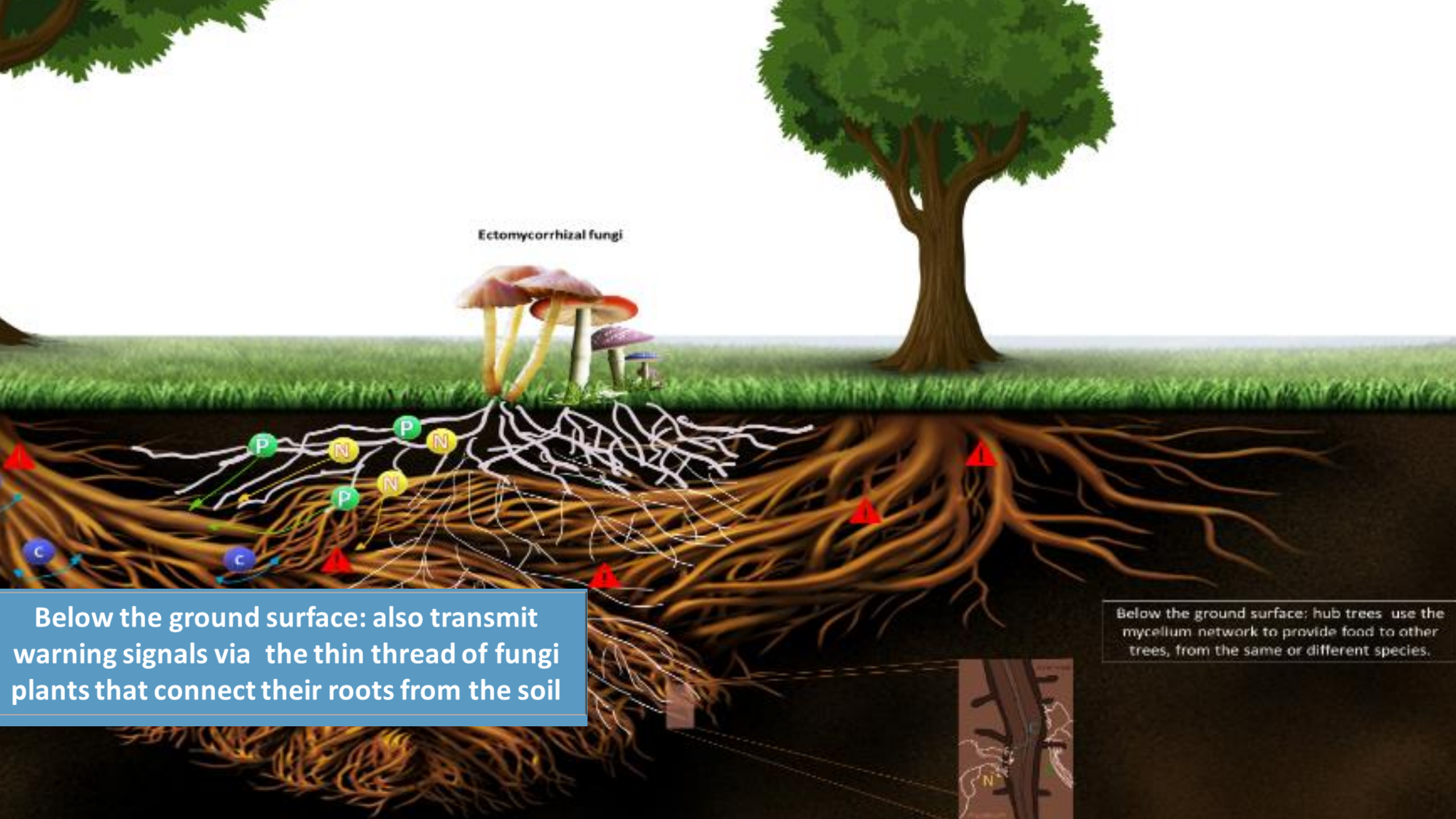
On the surface: emission of volatile organic compounds. These volatiles attract enemies of the herbivores, that is, organisms of the third trophic level (predators, parasitoids).





Below the ground surface:  
Chemical warning ⚠ Stressed plants secrete soluble chemical compounds from their roots, which are then absorbed by the roots of neighbouring plants.

The diagram illustrates a tree trunk on the right with three blue circles labeled 'C' on its trunk. Below the ground surface, the root system is shown in brown. Two red triangles with exclamation marks (⚠) are placed on the roots, indicating stressed plants. Blue circles labeled 'C' are shown on the roots, with blue arrows indicating the movement of chemical compounds from the stressed roots to the roots of neighboring plants.

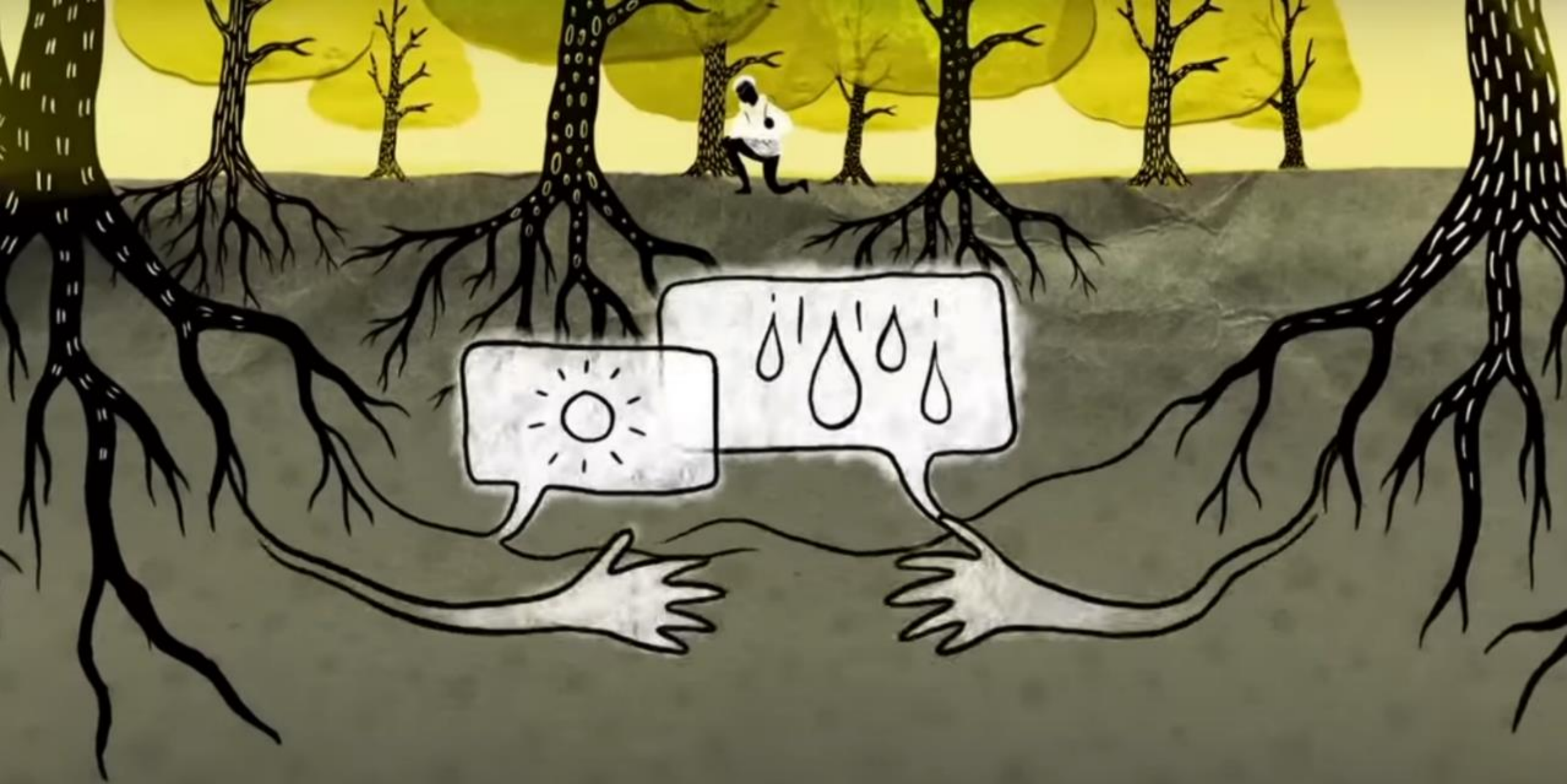


Ectomycorrhizal fungi

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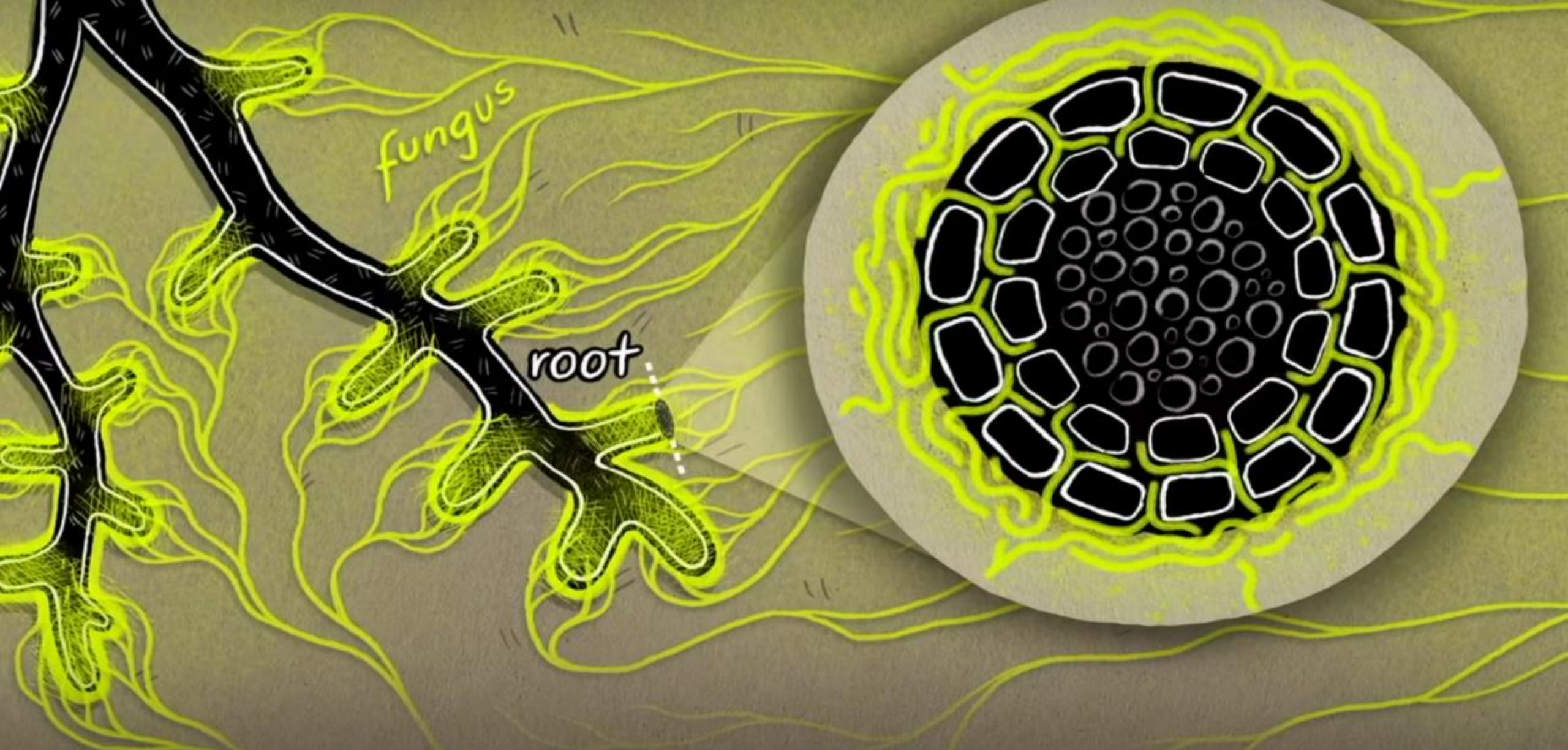




Plants talk to each other

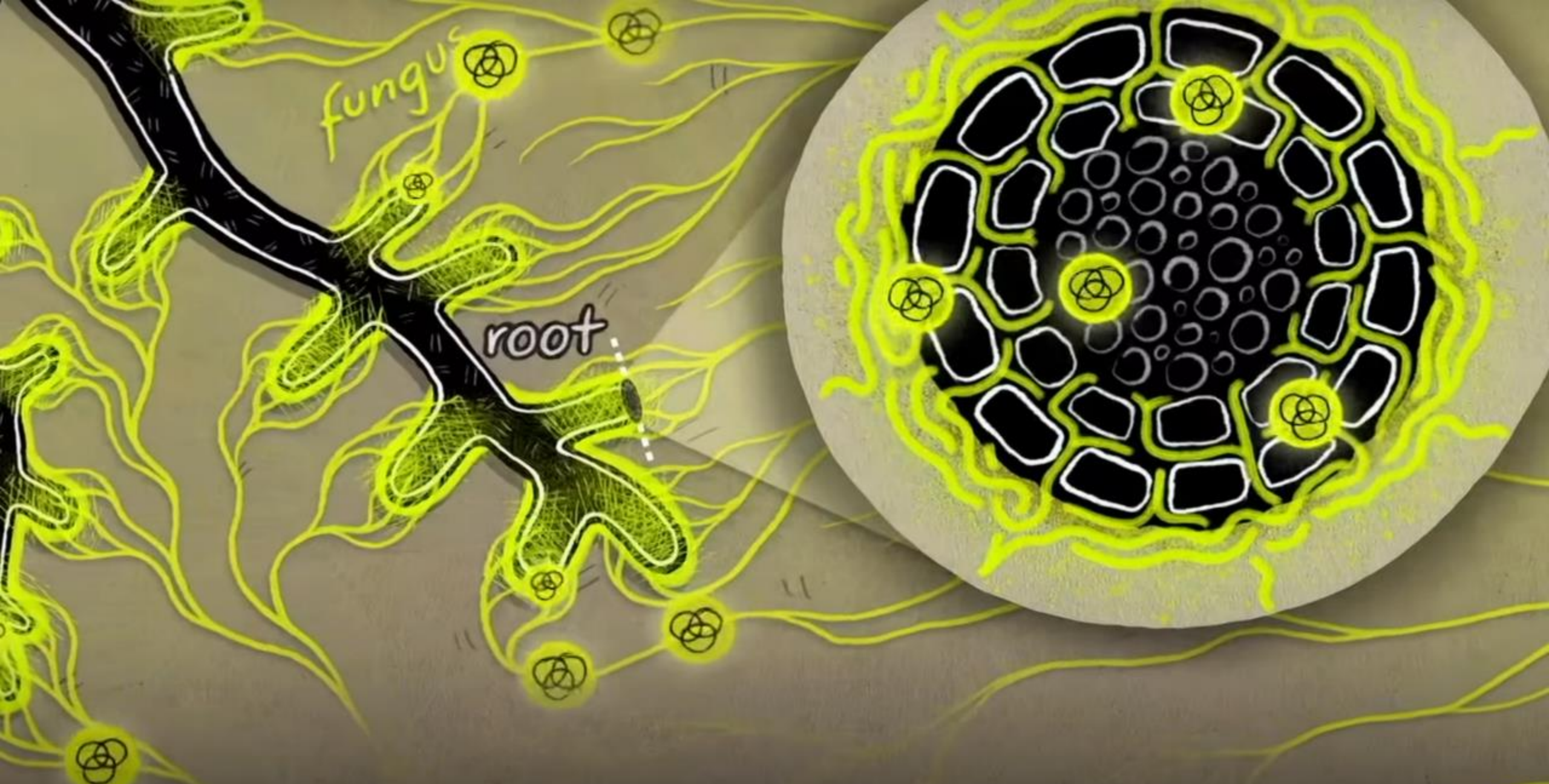


**They do this using a network of fungi**

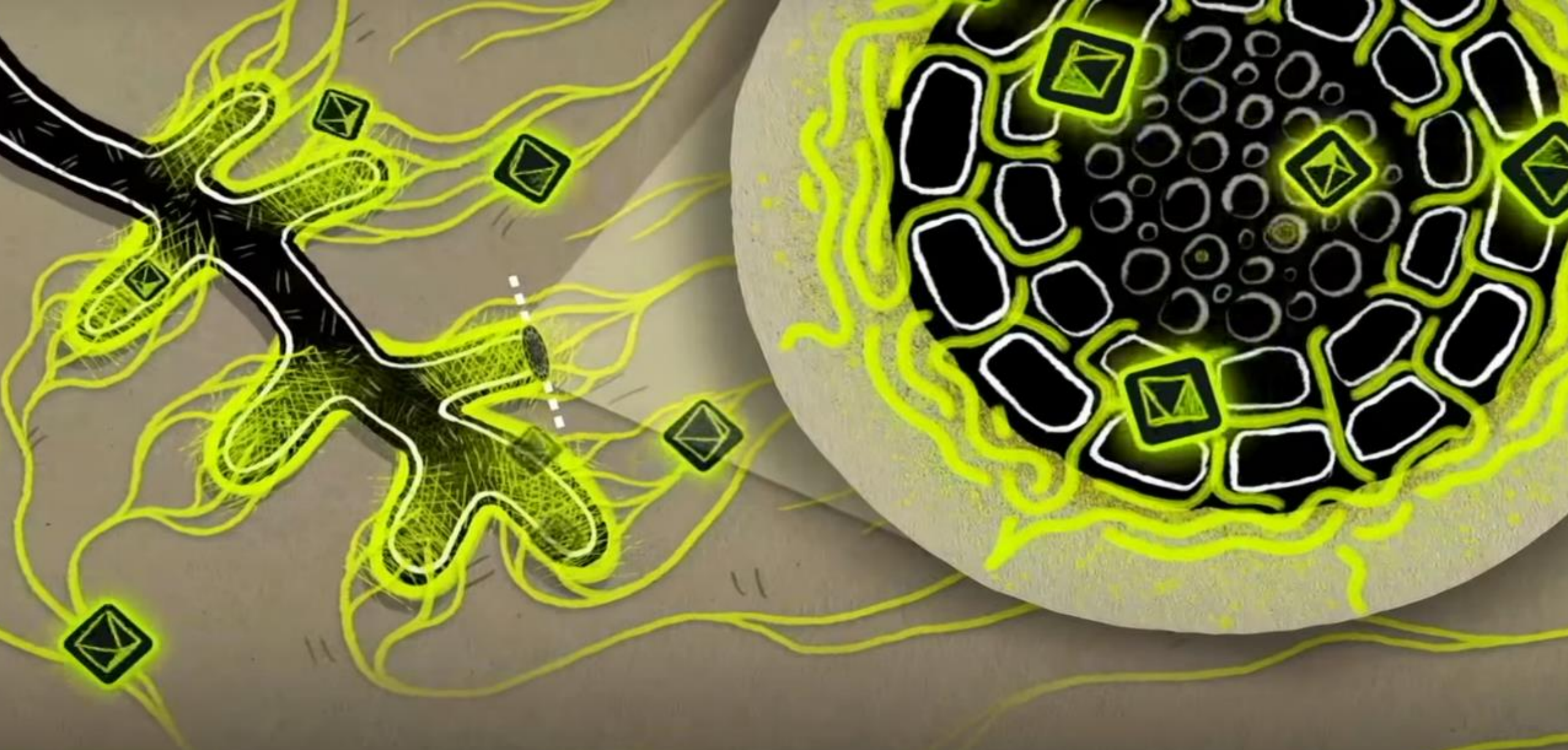


that grow around and inside their roots.

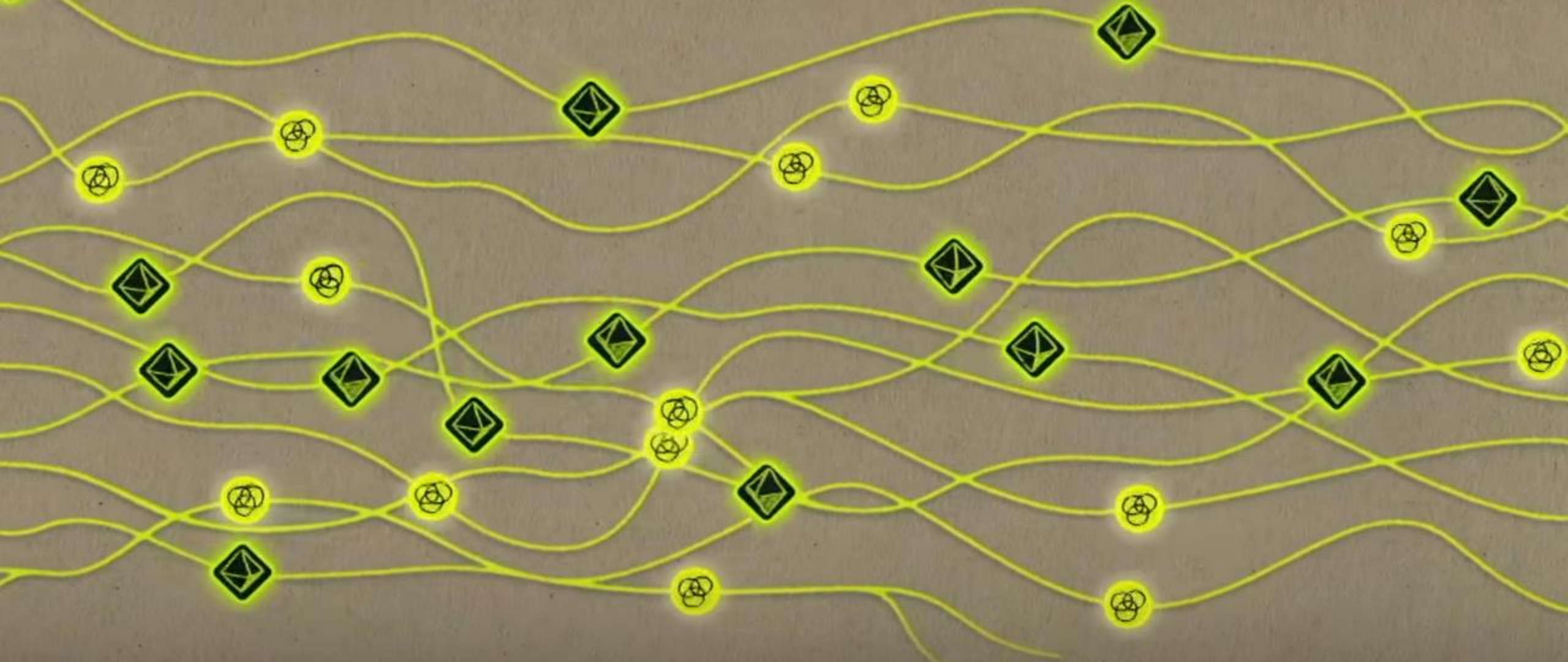




The fungi provide the trees with nutrients



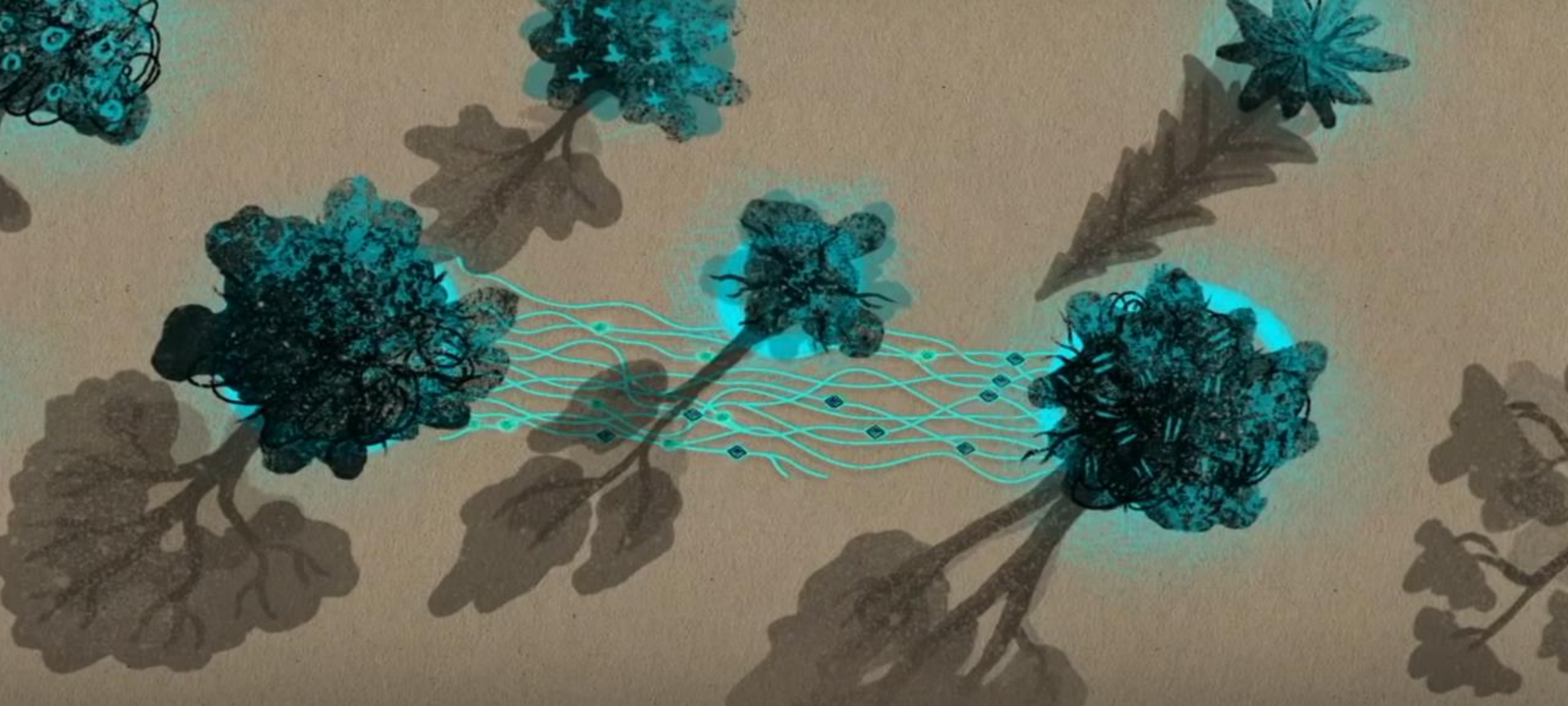
and in return they receive sugars.



**But scientists have found this connection runs far deeper than first thought.**



By plugging into the fungal network,



trees can share resources with each other.



## Plants

use this fungal network to supply shaded seedlings with sugars



**giving them a better chance of survival.**



**Those trees that are sick or dying**

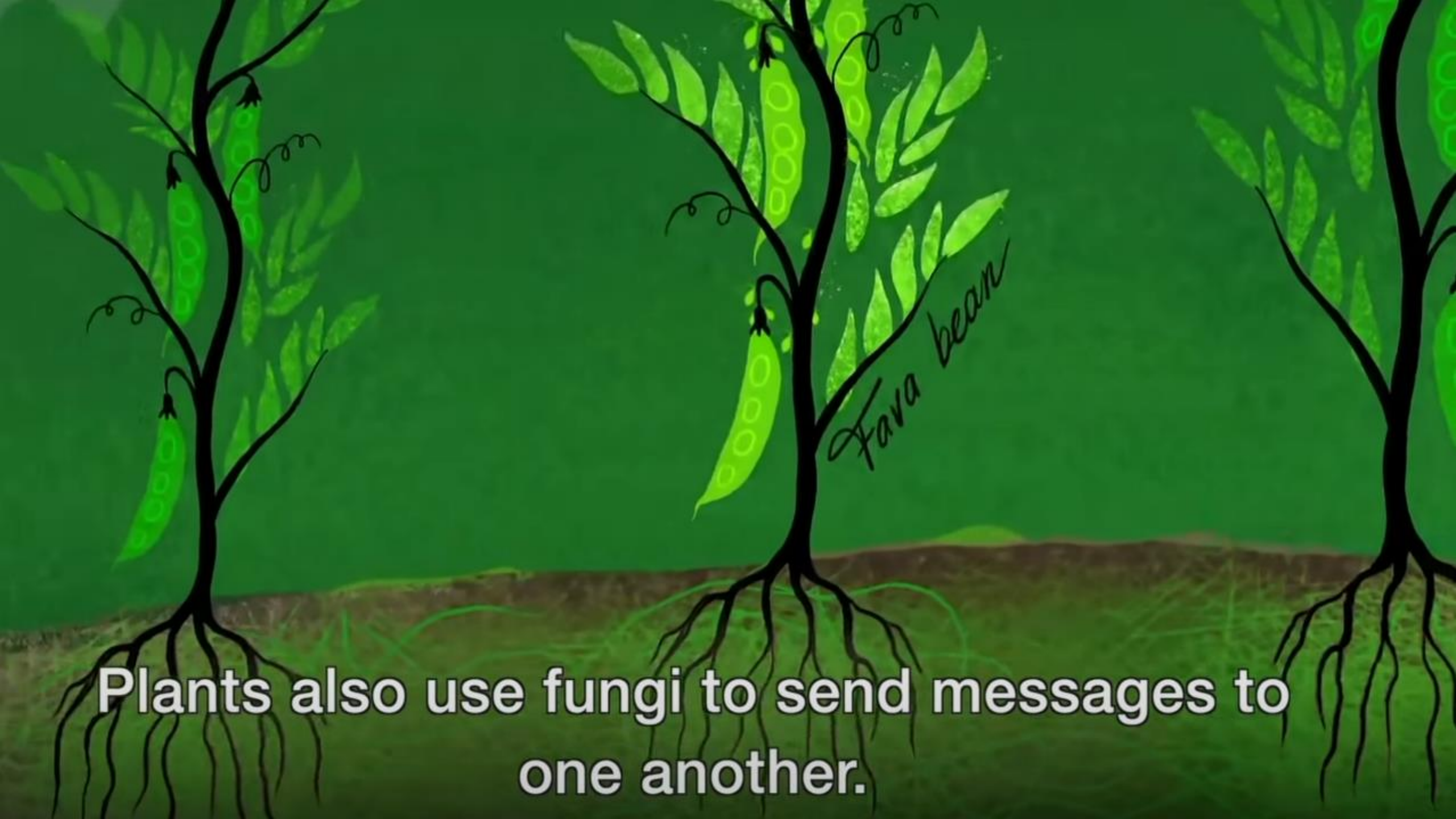




may dump their resources into the network



**which might then be used by healthier  
neighbours.**



*Fava bean*

**Plants also use fungi to send messages to one another.**



If they are attacked, they can release chemical signals through their roots



which can warn their neighbours to raise their defences.



But like our internet, the Wood Wide Web has its dark side too.



*Coralroot Orchid*

**Some orchids hack the system to steal resources from nearby trees**



*Black Walnut*

and other species, like the black walnut,  
spread toxic chemicals





through the network to sabotage their rivals.



**Arboreal cybercrime aside,  
scientists are still debating**



**why plants seem to behave in such an altruistic way.**

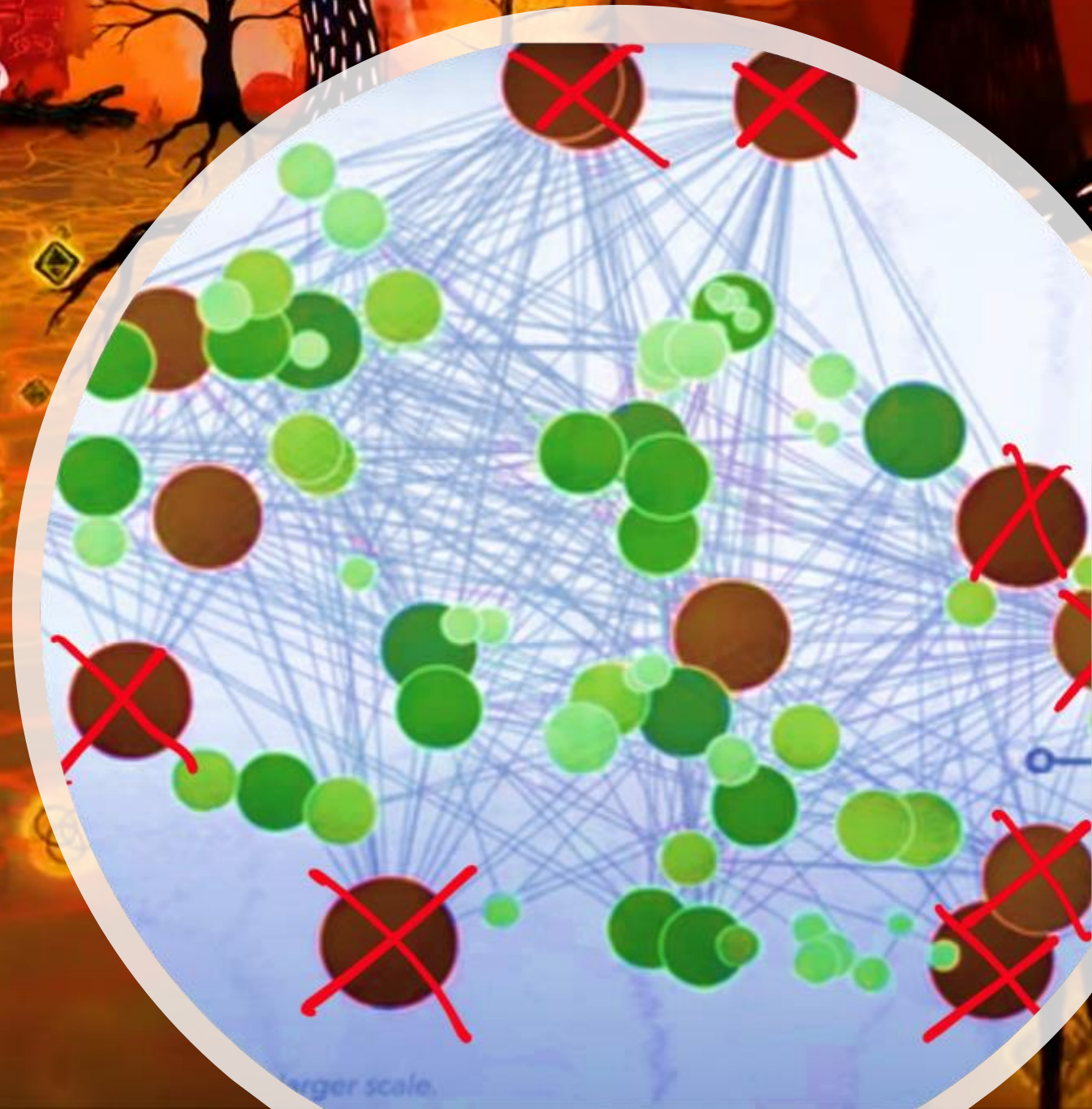


**The hidden network creates a thriving community between individuals.**



But, what happens...?

...if the old hub  
trees just,  
disappear?





This network can collapse



So next time





When you are next in woodland,



**you might like to think of trees  
as part of a big superorganism**



chatting and swapping information and food  
under your feet.



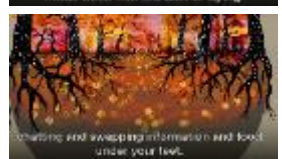
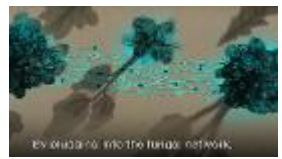
Let them keep communicating



Let them continue to be...



**The Wood Wide Web !!**



HANK

Y  
OU !!