

The sky's the limit on healthy soil



Switzerland alone loses 840,000 tonnes of healthy soil every year. Soil scientist Sonia Meller (left) and agricultural scientist H el ene Iven aim to help solve the problem.

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Intensive agriculture is taking its toll on our soils. ETH Pioneer Fellows H el ene Iven and Sonia Meller are aiming to bring a simple device to market that points the way to healthy soils.

What problem is your sensor designed to solve?

SONIA MELLER - At the moment, anyone who wants to know how their soil is doing needs access to a lab. There are some affordable test kits a farmer could theoretically use, but they're impractical and only measure individual indicators of soil health such as nitrogen content. Even for scientists, the technologies currently available are far from ideal, because the amount of soil samples that can be transported from the Namibian desert to ETH by aeroplane, for example, is limited. Our device is small and easy to use for carrying out measurements "on the ground", so to speak. Once enough data has been collected, it will also be possible to use artificial intelligence to translate the measurement results into customised and comprehensible recommendations for farmers or gardeners, for example in terms of fertiliser use.

Sounds logical - why has no one tried this before?

H EL ENE IVEN - We're lucky with our timing. For a long time, soil health was simply not an issue. The name of the game was to "produce, produce, produce!" It took a while for it to become clear how important soil health is in

terms of sustainable food production. Healthy soils play a key role in a wide range of areas; they help in the fight against climate change, for example, as they can store more CO₂, or filter our water.

Where are you up to at the moment?

SONIA MELLER - We'll have a functioning product by the end of the summer. This will be tested in pilot projects to validate our method. The first partners are already on board: the ETH Plant Nutrition group, where I completed my doctorate, and a project involving several research groups in the north of Sweden.

How would you describe your experience as young entrepreneurs so far?

SONIA MELLER - You're always "on duty", and it's not easy to find a healthy balance. It's just like with soil: overuse is not sustainable. All in all it's a fantastic growth experience, and I find it extremely motivating to be developing a solution to a real-life problem.

What does it mean for you as Pioneer Fellows to be benefiting from donor support?

HÉLÈNE IVEN - The support gives us valuable time to work on developing our strategy before approaching big investors. The recognition and visibility that come with the Pioneer Fellowship are also invaluable. It's a seal of approval that helps a great deal in discussions with partners and investors, and one we're extremely grateful for.

You met at the Student Project House: why are these creative spaces for students needed?

SONIA MELLER - For innovative projects to evolve, there's a need for places where students with expertise in a range of different areas can work together on their ideas away from their everyday studies. Places like the Student Project House and the planned ETH Centre for Students and Entrepreneurs



How healthy is my soil? The Digit Soil sensor provides answers by determining the activity of soil enzymes involved in natural carbon, nitrogen, phosphorous and sulphur cycles.

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