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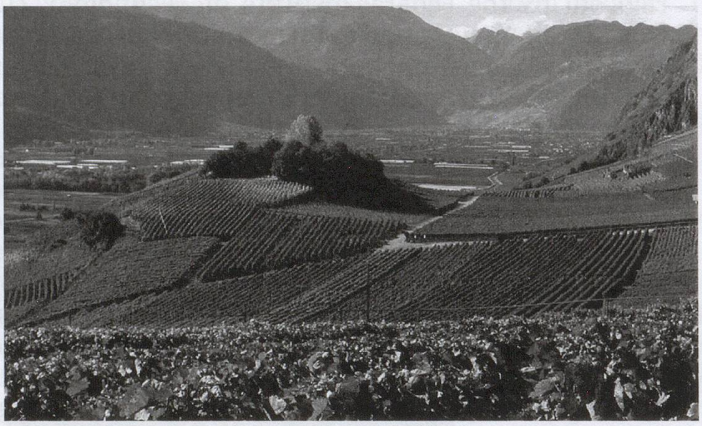
Alpine Vineyard

High on a hillside in canton Valais, where about 140 producers make some of Switzerland's most popular wines, Paul Schmidt runs a vineyard where the soil captures tons of carbon dioxide and methane gases each year while nurturing rich pinots noirs. He is what agronomists call a climate farmer, seeking to restore the soil's natural biodiversity while simultaneously preventing greenhouse gases from entering the atmosphere. What's more, the techniques he's using could soon generate more than SFr100,000 worth of electricity each year almost entirely from renewable sources - more than enough to power his operation.

Schmidt is a research consultant for Delinat in St Gallen, one of Europe's largest organic wine distributors that has interests in about 40 vineyards scattered all over the continent.

Most of the work he does with climate farming takes place in a small vineyard called Mythopia that he started four years ago on the terraced slopes above Sion. When he bought the vineyard the soil was dead, Schmidt says, the product of decades of chemical fertilisers and intense farming.



Vineyards in the Valais

"The problem with vineyards is that they create a monoculture that leads to the destruction of plants, insects, birds, animals and thousands of organisms living in the soil. You kill all of that to make wine when that isn't necessary. Without changing the quality of the wine you can keep it all alive."

An anthropologist at heart, Schmidt became interested in ancient agricultural methods on small, ecologically diverse farms. He drastically reduced the number of vines, introduced beehives and planted bushes, apricot trees and herb gardens.

"My neighbours spray against bees because bees feed on their grapes. I have bees but they don't eat the grapes, they go to the flowers because I have flowers."

Today his production is small, just 10,000 bottles a year, but each fetches up to SFr33, twice what his neighbours can charge.

But the most significant step Schmidt has made could rest in the soil. His hands cup chunky, black dirt that contains small bits of charcoal, such as you might find in a barbecue.

"In fact you could use it for a barbecue," he says. "But this is biochar. You can make it from anything organic, clippings, grass, or even the skins from pressed grapes."

Schmidt started making biochar about two years ago using a test machine that heats organic material up to about 550 degrees without oxygen, using a method called pyrolysis. The end product is biochar, as well as gas and heat that can be used to generate power.

Farmers in the United States have been dabbling with the pyrolysis, but Schmidt and Delinat are the first to do it in Switzerland. The implications are far reaching - and ancient.

In the 16th century a Spanish explorer found an Amazonian civilisation that enjoyed land far more fertile than it should have been. The secret was only discovered centuries later when a Cornell University professor found a track of rich black soil several metres deep right next to poor, thin soil. It was biochar, which could prove to be something of a wonder substance for countries with poor soil. It is like a dynamic sponge. It can store minerals, hold water, retain pollutants and house micro-organisms. But that's not all. When organic material rots in the open air, it releases carbon dioxide and methane, two contributors to global warming. Composting helps reduce the amount of gas released but pyrolysis is even better since it stops organic material from rotting in the first place, thereby keeping gasses from being released into the atmosphere. .

Schmidt says the test machine worked so well that Delinat now plans to purchase a larger machine for about €335,000 that will produce 1,000 tons of biochar. In addition it could also generate as much as SFr120,000 worth of electricity a year. It's a way to produce energy that isn't just climate neutral, but climate positive. Carbon would no longer be released by power generation, but placed in the ground.

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