Olive Trees in Southern Italy Massively Die off by a Bacterial Infection. It’s as if the Coliseum in Rome Collapses

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Figure 1: They have survived the plague, forest fires and even world wars, but a bacterium is wreaking havoc on the ancient olive trees in southern Italy. 21 million trees are already infected. Even worse: there is no cure, yet.

Olive farmer Giannuzzi Ippazio has a brown face, calluses on his hands and has eight shotguns in his cupboard. He prefers to talk about the harvest, his machines and olive oil. Ippazio is a tough man, or at least not an overly emotional man. Yet today he immediately gets tears in his eyes as soon as he enters his field.

Until recently, Ippazio owned 22 tarred hectares full of trees so old that they survived world wars, storms, forest fires, and invasions of kings and popes. The trees were cared for by his grandfather’s grandfather and his father taught him everything he knew here, just as he would teach his son everything here. But then Xylella fastidiosa bacteria invaded his olive tree orchard and Ippazio lost everything. All his trees are dead now.

A silent disaster is underway in the countryside of the southern Italian region of Puglia. Until recently, around 40% of total Italian olive oil production - considered to be one of the best in the world - came from here, but since 2013 more than one million trees have died and another 21 million have been fatally infected. Last year, more than 60% less olive oil was produced in Puglia than in the previous year, causing thousands of farmers, including Ippazio, to become unemployed. According to farmers’ association Coldiretti, the damage has since risen to €1.2 billion.

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It all started in 2013, not far from here. On a farm near the coastal town of Gallipoli, the branches of a number of olive trees suddenly turned brown. Then more branches followed, followed by whole trees and then whole orchards, just like the orchards next to it. It turned out to be the work of the \textit{Xylella fastidiosa}, a bacterium originating from America’s continents that probably came to Puglia via Costa Rica and Rotterdam. \textit{Xylella} nestles in the wood barrels of an olive tree to dry out the tree branch by branch. Green leaves turn brown, olives shrink, after which the entire tree dies.

This is a disaster for Puglia, because it is impossible to separate the region from its olive trees, if only because more than 66 million specimen cover the local landscape like a blanket. In particular, the half-million ulivi secolari (trees that are sometimes a thousand years old) enjoy an almost mythical status among the local population and moreover, count as an unprecedented tourist magnet - Puglia’s second most important economy. It is not without reason that the ulivi secolari were declared World Heritage by UNESCO. The olive trees of Puglia are perhaps even more defining for the worldwide image of Italy than the Roman pine trees or the Tuscan cypresses. "These trees are our heritage", says Ippazio. "When they fall over, it is as if the Coliseum in Rome collapses".

Yet that is now likely to happen because, according to the European Commission, \textit{Xylella} is one of the most dangerous plant bacterium in the world. On the one hand because it can infect up to 350 trees and shrub species, including crops such as grape, coffee, almond, oleander, rosemary and peach, but above all because there is no cure for the disease. Only preventive solutions help, such as the use of aggressive pesticides or, root and branch removal of the infected trees, or starting over again with Xilella resistant olive tree strains. It is precisely there that Puglia has gone terribly wrong in the last six years.

\textit{Xylella} has not only infected millions of olive trees in recent years, but has also brought out the worst in the southern Italian national character. Simple rules and procedures were ignored in favour of self-interest, risks were denied and as soon as things went wrong, someone else was at fault, mostly incompetent or corrupt politicians. That typical Italian aversion to change came forward, as did the distrust in Italian institutions. Even the mafia gained extra foothold thanks to the bacteria because it opened the doors to large-scale food fraud. It makes \textit{Xylella fastidiosa} a sad metaphor for southern Italy.

Like so many locals, President Melcarne has lost more than 80% of his olive trees in recent years. He sold his press machine to a producer in Morocco and the new house that he was planning to build is unfinished in his yard. He has no more money for it. "Almost im-

\textbf{Figure 2:} "All the families in this region lived off the oil," says Ippazio. "Even the thieves were able to make ends meet here because they stole olive oil." The roots of the olive tree are, according to him, so fused with the roots of his people that the Xylella not only affects the trees, but the entire society.

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Figure 3: The way we dealt with this was disastrous, "says Giovanni Melcarne, president of the Consorzio Dop Terra d'Otranto, the association that represents the interests of olive farmers in this region.

mediate after the disease was discovered, the European Union said the infected trees should be cleared as quickly as possible, just like the still healthy trees in a buffer zone around it. That didn’t happen. Far too many farmers, especially smaller farmers in the buffer zone, refused to believe that there was such a thing as *Xylella fastidiosa*.

Melcarne lists what he has heard in recent years: Israel would have brought the bacterium to Italy to disrupt the country, biotech company Monsanto (taken over by Bayer since 2018) would have deliberately developed it because it has a patent on two resistant olive tree species, the European Union would have sucked everything out of her thumb to fill vacated agricultural land full of solar panels, the mafia needs land to build hotels thereby laundering criminal money. They are all conspiracy theories which are continuously circulating because pseudo-scientists endorsed them and even national politicians such as Beppe Grillo, the founder of the five-star movement, repeatedly questioned the seriousness of the *Xylella fastidiosa* impact on agriculture, especially the olive and olive oil bio-industry.

When distrust focused on the scientists investigating local *Xylella fastidiosa* variants - they allegedly brought the virus to Puglia on behalf of businessmen who wanted to build a gas pipeline from Azerbaijan - local politicians even had raids at three laboratories in the region. There was nothing incriminating in the judicial investigation, but it made the scientists cautious. According to the science journal Nature, there have hardly been any tests on this bacterium since the raids during 2016. “Many farmers use that doubt as a guide,” says Melcarne. “If you have a choice between the preventive logging of centuries-old trees that have survived wars and the plague because a so-called invisible bacterium is active later on, or simply deny everything after which you can harvest for a few more years, then naturally you opt for the second, certainly when politicians chasing the votes of the ignorant agree with you”.

As the *Xylella* army continued to advance in the olive tree orchards, the government announced a state of emergency in 2015 and mobilized €11 million to eradicate the disease. Due to yet another wave of opposition, not even half of that amount was spent in the first two years. Farmers in buffer zones tied themselves to their trees when they had to be felled, they blocked roads and stations and when a government decree to use chemical pesticides was introduced, eight municipalities decided to boycott the decree. Even farmers who wanted to follow the rules by clearing their trees were stopped by ecological action groups.

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What reinforces the suspicion is that the disease spreads in a strange way. The insects that spread the bacteria, the so-called spit beast (Philaenus spumarius), do not systematically go from branch to branch or from tree to tree, but start to eat where and when it suits them. As a result, the disease seems to spread randomly, as if the landscape has the spots of a leopard. It can sometimes take up to four years for all trees to die. Because decree enforcement is completely inadequate, most farmers leave their ill-looking trees as long as possible. With those trees, they can still continue to produce some olive oil and earn (some) money. Only when all those trees have died, do they believe in the existence of Xylella fastidiosa, says Melcarne.

At the front

What once started as a relatively small problem on 9000 hectares has become a disaster of almost European proportions because of that chronic lack of action. Isolated cases of Xylella have already surfaced at olive groves in Tuscany, France, Spain and Portugal. Holiday-makers are warned this summer not to bring home olive trees, oleanders or lavender plants from Italy due to the Xylella fastidiosa disease outbreak. The bacterium is now more than a hundred km to the north than when the first measures were announced by the EU.

“We are here about ten kilometers from the front,” says grower Leonardo Capitanio (30). “Because that's how it feels: like a war we are losing.” That means that within six months Capitanio is in danger of losing the bulk of his business, just like many of his employees will lose their jobs. “The problem is that almost everyone in Puglia is an olive farmer,” he says. “The lawyer and the entrepreneur from the city also have a few hectares. If one of them continues to claim that the bacterium does not exist at all and therefore refuses to cut his/her trees, the disease still catches everyone. It is that silliness, that self-centeredness, in combination with a total lack of enforcement, which keeps Xylella constantly advancing, "says Capitanio.

The solution is fairly simple. “Xylella has also been found by a grower in the Netherlands. Do you know what happened then? All his plants were cleared and he received a fair compensation from the state. But yes, this is not the Netherlands. This is southern Italy.” He stands under the oldest olive tree in his yard, “the king of my jungle,” under which he even spread the ashes of his prematurely deceased father. And unfortunately, this tree, which, according to Capitanio, could be 1500 years old, will die in a few months because of that lax attitude. Moreover the mafia is starting to take over the countryside.

Partly due to the disastrous consequences of Xylella in Puglia, the country’s most important olive oil region, Italian olives are almost 30% more expensive this year than in 2018, when the price had already risen compared to 2017. The competition from mainly North
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African countries is a killer for the olive business in Italy (and other southern European countries), more and more Italian olive oil producers are looking for alternatives to lower prices, to be read as fraud. This varies from relatively innocent tampering by farmers themselves - selling virgin oil (max. 2% free acid) as the better quality extra virgin (max. 0.8 percent free acid) - to truly criminal fraud involving organized crime syndicates mixing chemicals with olive oil on a large scale. According to the farmers’ association Coldiretti, the southern Italian mafia is now deeply involved in the food industry. If you sell fake oil as extra virgin, you can achieve profit margins of up to 700%. These are margins comparable to cocaine trading, while the risks are many times lower. According to the farmers association Coldiretti, the Italian mafia and ‘n drangeta earned about €22 billion in 2017, through food fraud. This is an estimated 15% of the Italian organized crime syndicates yearly turnover.

It can be concluded that, to get the olive and olive oil industry back on track, actions and policies have to be undertaken, which stop the involvement of organized crime, which enforces the farmers organizations and especially informs farmers to take drastic measures if needed. Cut orchards should be replanted with Xylella resistant olive trees, subvented in part by Italy and the EU. If not, it will most probably take half a century before virgin olive oil is produced again in southern Italy, if farmers stay where they are. If the farmers and unemployed migrate, this type of agriculture will be lost for Italy for a very long time.

Hence no time to wait till it’s too late.

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