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Schito S., Percoco A., D'Onghia A.M.

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Legislative aspects for the mandatory control of *Xylella fastidiosa* in Puglia and in Italy

Silvio Schito[1], Anna Percoco[1], Anna Maria D'Onghia[2]

[1] Servizio Fitosanitario Puglia, Bari - Italy
[2] CIHEAM, Istituto Agronomico Mediterraneo di Bari - Italy

Puglia is the main olive-growing region in Italy (32% of the national olive-growing area) and olive trees cover 29% of the Puglia agricultural surface. In summer 2013, numerous cases of olive trees, mainly the ancient ones, showed Olive Quick Decline symptoms (OQDS) in the Southern part of Puglia (Lecce province). In October of the same year the National Research Council of Bari (CNR) reported for the first time the presence of the quarantine bacterium *Xylella fastidiosa*, subsp. pauca, strain CoDiRO as the main cause associated to the OQDS. Following the indications of the EU Directive 2000/29 (08.05.2000), the Regional Plant Protection Service of Puglia (RPPS) immediately communicated the finding to the Ministry of Agriculture, Food and Forestry Policies (MiPAAF) and to the European Commission; a series of measures and actions against *X. fastidiosa* were soon taken (Table 1). A large scale monitoring of the pathogen was conducted soon after the finding in the entire Region by analysing over 16,000 host plant samples (primarily olive trees) and delimiting the infected and buffer zones. The movement of plants from the infected area was blocked and strict measures were adopted for nurseries and producers.

The dramatic nature of the emergency and the increasing extent of the infection prompted MiPAAF in 2014 to adopt urgent measures for the containment of the bacterium across the whole Puglia. In February 2015, the Italian Council of Ministers declared a state of emergency and appointed a Commissioner (head of the Civil Protection department) and a national scientific committee for advising technical decisions. The Commissioner adopted all available means in order to prevent the pathogen from further spreading, thereby endangering olive cultivation in Puglia, in Italy, in Europe and the whole Mediterranean region. Several emergency measures were then implemented, with regard to territorial management and in response to the measures of the European Commission. An Action Plan for the rapid implementation of the mandatory control measures against Xylella, as indicated in the Ministerial Decree (MD) no. 2777 (26.09.2014) was applied throughout 2015. The main measures were: the elimination of infected plants, in order to reduce possible pathogen inoculum, and the containment of the insect vector population, *Philaenus spumarius* , also known as "meadow spittlebug", which is the only confirmed vector in Puglia.

Philaenus spumarius could have an important epidemiological role in spreading the infection, because it is a polyphagous insect showing a high population density in the South of Puglia due to the favourable climatic conditions and poor agronomical practices in most of the olive groves. This insect is believed to have only one generation per year, developing mainly from spring to autumn, with overwintering eggs. Its biological cycle starts in April when nymphs hatch from the eggs. The nymphs live on the stems of the herbaceous vegetation, and cover themselves in a liquid foam to maintain their correct moisture level and protect from their natural enemies. Once they reach the adult stage, they fly onto the aerial parts of trees and feed on xylem with their stylets. Objective of the Action Plan was to reduce the number of nymphs as much as possible through the application of specific agronomical practices (e.g. tillage) against wild herbaceous plants in spring or else by burning, using string trimmers or applying insecticides registered for use against phytophagous insects, which are effective against the juvenile stages. The control was also against the adult stage, which is the most dangerous for the dissemination of the infection, through phytosanitary treatments applied in autumn on olive trees and other fruit trees in the affected areas. Awareness

campaigns were developed in the Action Plan such as: dedicated website www.emergenzaxylella.it, Ministry press, meetings with farmers, nurserymen and stakeholders, posters, leaflets, video on media, etc.

Following the MD issued on 19.06.2015, official investigations were conducted on host plants and insect vectors in all Italian regions, primarily in areas considered at higher risk of introduction of *Xylella* (nurseries, garden centres and production sites). A total of 17186 sites were inspected and 13766 analyses were performed without any finding of the infection. In the region of Puglia a similar number of sites were also inspected (17124 sites) but with a higher number of analyzed samples (50.488 samples).

In 2016, the survey programme was co-financed by the European Commission and results showed that infection had spread across the whole province of Lecce, which was the original infected area, and reached the provinces of Brindisi and Taranto. Financial compensation was planned for economic loss due to *X. fastidiosa* and the cost of removal of olive trees.

Following the EU Commission Implementing Decision 2015/789, phytosanitary measures were issued based on the new demarcated area, which includes the infected zone and buffer zone (10km surrounding the infected zone). Intensive monitoring, eradication and containment measures, vector control, movement restrictions of plants, planting prohibition of host plants are the main actions conducted in the buffer zone and in the infected zone surrounding the buffer zone (a 20km-wide strip). As for the buffer zone, in addition to the infected plants, all pathogen host species are removed in a radius of 100mt around the infected plant/s, regardless of their health status.

Since its first discovery in 2013, more than 200.000 plants have been tested mainly in the buffer and containment areas with the aim of determining the presence and spread of the infection for the application of eradication/containment measures. The spread of the infection covers approximately 180000 ha, i.e. 16% of the national olive-growing area. Sampled and infected plants in the demarcated area have been mapped and the management of the monitoring data has been fully computerized. The graphical representation of the areas monitored and their results are available on the official website of the Puglia Region (www.emergenzaxylella.it). A series of different activities took place in order to raise awareness such as dedicated website, meeting with farmers, distribution of 16.000 informative leaflets and others. Plant Protection Service, Forestry and Municipality police (about 500 units) have been employed in the application of the phytosanitary measures as indicated in the contingency plan against *X. fastidiosa*.

The work conducted by the RPPS of Puglia was very hard due to the limitation in the removal of the infected trees caused by the civil protest and by the appeals of the Regional Administrative Court.

Table 1. Synthesis of the main actions taken after the first finding of *Xylella fastidiosa* in EU (2013-2016) by Regione Puglia, Ministero Italiano delle Politiche Agricole, Alimentari e Forestali (MiPAAF) and European Commission.

2013	
October	OFFICIAL COMMUNICATION OF XYLELLA FASTIDIOSA FINDING IN PUGLIA REGION
	Measures for the movement of host plants
	Temporal Blocking of plants movement from the Province of Lecce (Apulia)
	Provisions on the implementation measures for *X. fastidiosa* in Puglia region
November	1st Monitoring of *X. fastidiosa* for the definition of the delimited areas
2014	
February	COMMISSION IMPLEMENTING DECISION (EU) 2014/87 as regards measures to prevent the introduction into and the spread within the Union of *X. fastidiosa*
March	Removal of infected trees in Apulia region
April	Definition of the outbreak area of Apulia region
July	COMMISSION IMPLEMENTING DECISION (EU) 2014/497 as regards measures to prevent the introduction into and the spread within the Union of *X. fastidiosa*
July	Definition of the infected and buffer zones
September	Regional Council Deliberation of Puglia n. 1824 - Declaration of the extraordinary phytosanitary emergency for *X. fastidiosa*
	Ministerial Decree - Establishment of the national Technical Scientific Committee on *X. fastidiosa*
	Ministerial Decree - Emergency measures for the prevention, control and eradication of *X. fastidiosa* in the Italian territory
	Guidelines for the containment of the spread of *X. fastidiosa* sub. pauca, strain CoDiRO in Puglia region
October	2nd Monitoring of *X. fastidiosa* for the definition of the delimited areas in Puglia region
2015	
February	Appointment of a special Commissioner for the emergency of *X. fastidiosa*
March	Action plan for implementing measures for *X. fastidiosa* in Puglia region
	Definition of the delimited areas for *X. fastidiosa* in Puglia region
March	COMMISSION IMPLEMENTING DECISION (EU) 2015/789 as regards measures to prevent the introduction into and the spread within the Union of *X. fastidiosa*
June	Ministerial Decree - National surveys and updating of the demarcated area in Apulia
September	New Action Plan for *X. fastidiosa* in Puglia region
	Removal of spontaneous/host plants
	Control of vectors
	Pruning of olive trees removing symptomatic parts
	Strengthening of checks on the movement of specified plants
	Surveys activities
	Removal of infected plants and host plants in 100mt radius
December	Definition of the delimited areas for *X. fastidiosa* in Puglia region
	Ministerial Decree - Extension of financial contributions to the farmers
December	COMMISSION IMPLEMENTING DECISION (EU) 2015/2417 amending Implementing Decision (EU) 2015/789 as regards measures to prevent the introduction into and the spread within the Union of *X. fastidiosa*
2016	
February	Ministerial Decree - Official recognition of pest-free areas in all Italian regions, with the exception of the demarcated area in Apulia
May	COMMISSION IMPLEMENTING DECISION (EU) 2016/764 amending Implementing Decision (EU) 2015/789 as regards measures to prevent the introduction into and the spread within the Union of *X. fastidiosa*
September	3rd Monitoring of *X. fastidiosa* for updating the demarcated areas

April 2014 **July 2014** **March 2015**

June 2015 **May 2016**

Figure 1. Definition of the demarcated areas in Puglia for *Xylella fastidiosa* following results of the monitoring activities in the period 2013 – 2016.