

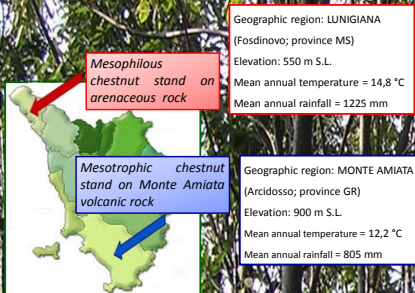
IMPACT OF *DRYOCOSMUS KURIPHILUS* (YASUMATSU) ATTACK ON CHESTNUT COPPICES GROWTH

Barbara Mariotti¹, Leonardo Antonello¹, Andrea Tani¹, Mario Vannuccini², Alberto Maltoni¹

¹ GESAAF Department of Management of Food, Agricultural and Forest Systems, University of Florence, Italy
alberto.maltoni@unifi.it

² Studio Eureco – mario.vannuccini@studioeureco.com

STUDY AREAS



The aim of this study is to evaluate if and how much chestnut coppices growth is influenced by *Dryocosmus kuriphilus* (Yatsumatsu). The research was carried out in two coppices in Central Italy (Tuscany) with different levels of *D. kuriphilus* attack. Crown position of the sprouts included in the study areas was classified into 2 categories: dominant and overtopped. Then a sample of dominant and overtopped sprouts was chosen. The studied sprouts (25 per area) were felled to remove a trunk cross section at DBH. The trunk sections were examined with dendrochronographe to measure the radial growth.



DENDROMETRIC DATA

	LUNIGIANA	MONTE AMIATA
AGE (years)	16	13
SPROUT (n ha ⁻¹)	3869	3153
• Dominant	2245	1799
• Overtopped	1642	1345
BASAL AREA (m ²)	21,39	20,63
• Dominant	17,59	16,14
• Overtopped	3,79	4,49
MEAN DIAMETER (cm)	8,4	9,1
• Dominant	10,0	10,7
• Overtopped	5,5	6,5
MEAN HEIGHT (m)	12,1	14,4

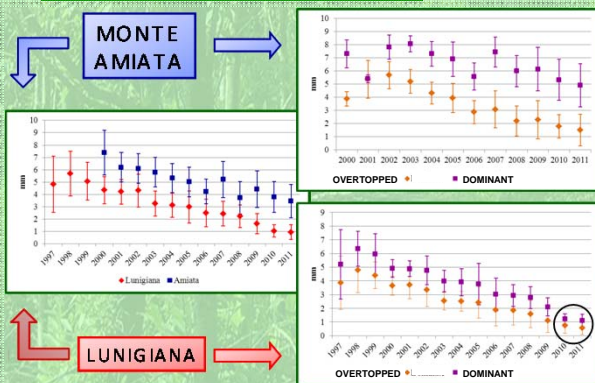
RAINFALL DATA

LUNIGIANA		Anni	MONTE AMIATA	
Veget. Season	Annual		Annual	Veget. Season
1996	435,5 (+9,7%)	1996		
1997	275,2 (-30,6%)	1997		
1998	431,5 (+8,7%)	1998		
1999	432,0 (+8,8%)	1999	806,0 (-1,6%)	300,2 (-1,6%)
2000	381,5 (-3,9%)	2000	1092,6 (+33,4%)	320,4 (+5,0%)
2001	348,0 (-12,4%)	2001	615,8 (-24,8%)	236,2 (-22,6%)
2002	621,3 (+56,4%)	2002	800,6 (-2,2%)	391,0 (+28,2%)
2003	447,8 (-12,8%)	2003	680,2 (-16,9%)	210,0 (-31,2%)
2004	572,4 (+44,1%)	2004	845,6 (+9,3%)	262,0 (-14,1%)
2005	343,8 (-33,4%)	2005	963,0 (+17,6%)	369,2 (+21,6%)
2006	284,8 (-28,3%)	2006	725,2 (-11,4%)	384,4 (-26,0%)
2007	281,8 (-29,0%)	2007	561,8 (-31,4%)	240,4 (-21,2%)
2008	337,2 (-15,1%)	2008	1265,8(+54,6%)	397,2 (+30,2%)
2009	406,0 (+2,2%)	2009	832,2 (+1,6%)	279,2 (-8,5%)
2010	846,4 (+113%)	2010	1339,0(+63,5%)	478,2(+56,7%)
2011	355,0 (-9,9%)	2011	637,8 (-22,1%)	271,0 (-11,2%)

PHYTOSANITARY DATA

	LUNIGIANA	MONTE AMIATA
FIRST GALL WASP INVENTION	2008	2010
ATTACKED SPROUTS (%)	100	100
• Dominant	100	100
• Overtopped	100	100
ATTACKED BUDS (%)	82,7	>10
• Dominant	85,5	>10
• Overtopped	79,9	>10
S1 and S2 DAMAGES (%)	75,4	42,1
• Dominant	78,0	43,7
• Overtopped	70,5	40,5

RADIAL INCREMENT



A NON INVASIVE APPROACH The study included also a non-destructive method for measuring radials increments by penetrometers (resistograph); the data were collected on the same samples (at DBH) to compare the results.



The resistographic measurements were effective only in 50% of surveys; a fine tuning of the method is necessary.

The results have to be evaluate considering the climatic data (rainfall is our focus) of the years corresponding to before and after the attack. No correlation with precipitations (r^2 always $< 0,2$) and no relation with exceptional rainfall regimes (such as in 2003 and 2010) were found. Differences in growth dynamics show that the presence of *D. kuriphilus* is more influencing the radial increment than climatic course; in the affected area the development of the dominant sprouts was limited by the pathogen to become similar to the overtopped sprouts growth rate.