Sustainable agronomical practices and reduction of water pollution

These OGs are funded by the Emilia-Romagna region within the Rural Development Plan 2014-2020

Op. 16.1.01 – GO EIP-Agri - FA 4B,

and coordinated by CRPV.

Maria Grazia Tommasini

Brussels, 11th April 2018

FRUTTANOVA - Emerging pest of horticultural crops in Emilia-Romagna: innovative strategies applied to sustainable crop protection

SOS FRUTTA - Environmentally friendly innovative crop protection strategies, residual mixtures management and updates on water needs for a sustainable fruit production.

RESISTANCE - Diagnostic techniques, spatial distribution and management of resistances of the main plant pathogens, insect pests and weeds towards plant protection products

SOS VITE - Application of sustainable techniques and methods for crop protection, irrigation and nutrition in viticulture

OPERATIONAL GROUPS

Rural Development Plan 2014-2020
Meas. 16.01 – FA 4B

TITLE: FRUTTANOVA - Emerging pest of horticultural crops in Emilia Romagna: innovative strategies applied to sustainable crop protection

Project Leader	ASTRA
Duration (36 months)	15.04.2016 - 14 .04.2019
Budget	€ 328,749
Research Partners (3)	Astra, Univ. of Bologna, CRPV
Farms and Farmers Organisations (7)	Apofruit, Cereali Padenna, Apoconerpo, Granfrutta Zani, Az. Punto Verde, Az. Lucchi, Az. Zoffoli

This plan has the OBJECTIVE to develop strategic and sustainable protection tools/protocols against EMERGING

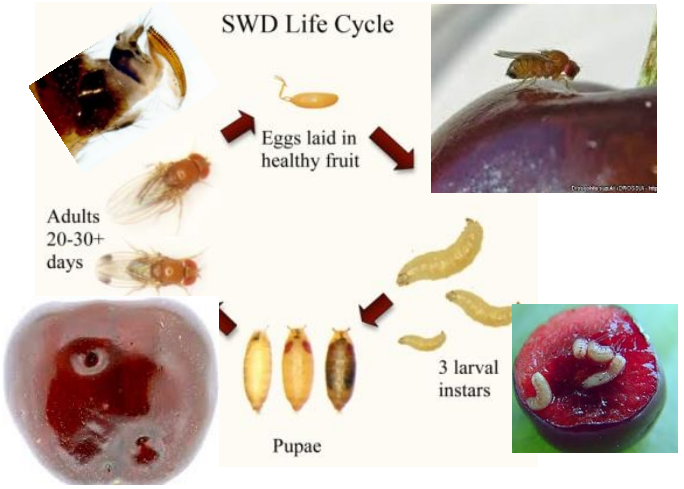
PESTS
[*Drosophila suzukii*]

DESEASES
bacteria, viruses, viroids and prokaryotes
[e.g., PSA, ESPY, PPV, GPGV, ToRSV, PLMVd]

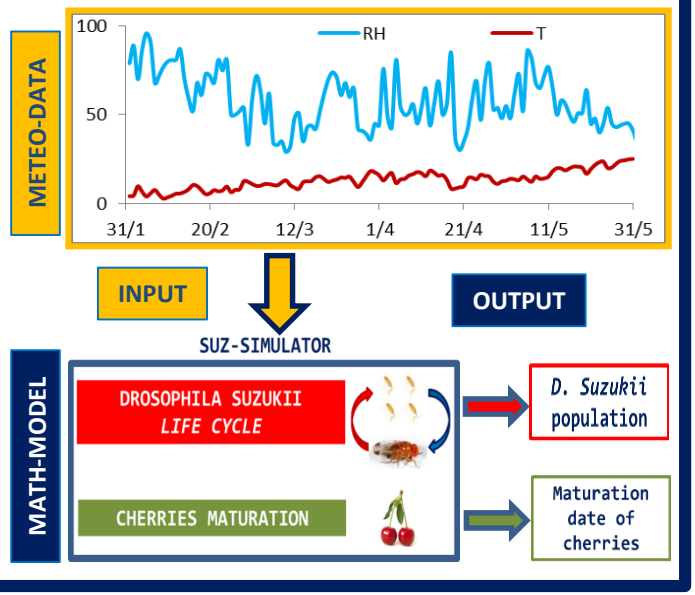
Rural Development Plan 2014-2020
Meas. 16.01 – FA 4B, Pr. FRUTTANOVA

SYSTEM FOR SIMULATION

***DROSOPHILA SUZUKII* (Spotted Wing Drosophila) IS A MULTIVOLTINE POPULATION**



MODEL DIAGRAM

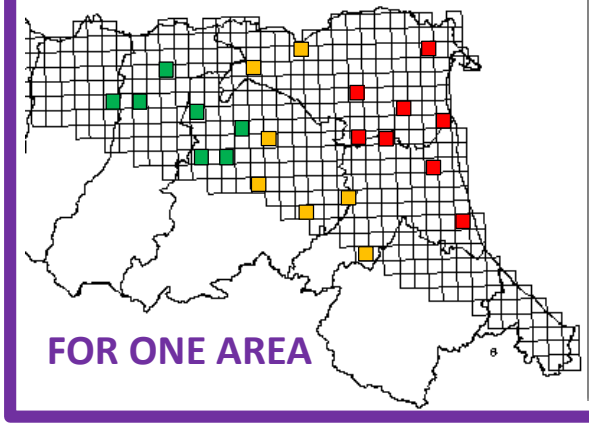


APPLICATION

OPTIMIZATION OF PEST-CONTROL

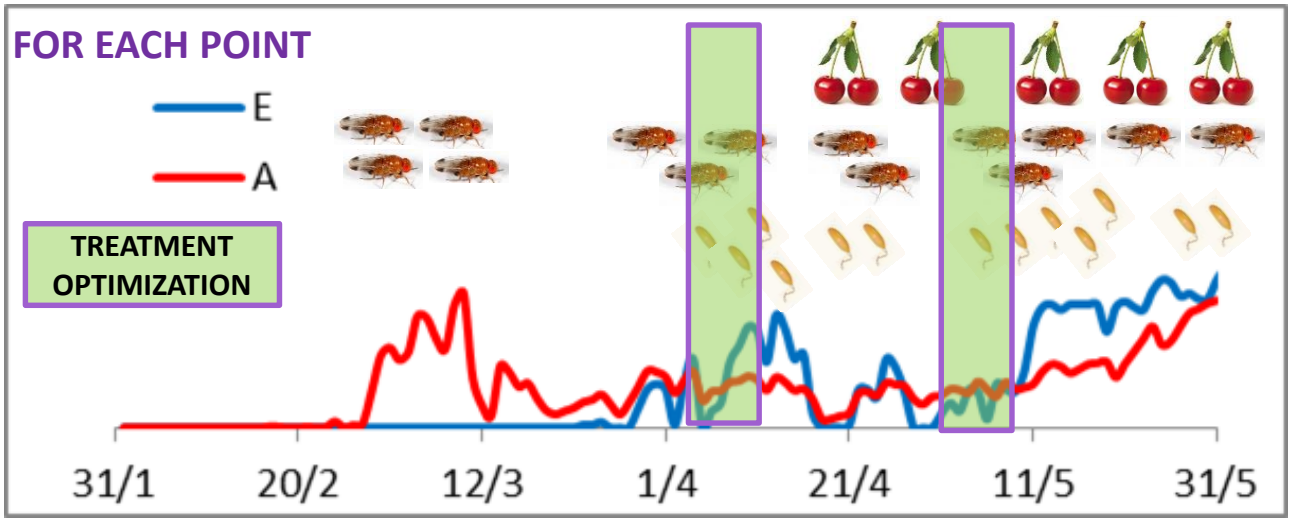
- Lower use of pesticides
- Maximum effect on pest population
- High quality of fruit production
- Best environment conditions

SIMULATIONS MODEL: FORECASTING RISK



FOR ONE AREA

FOR EACH POINT



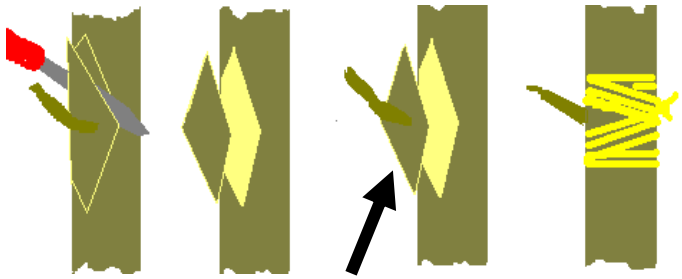
ESFY - European Stone Fruit Yellows (phytoplasma)

Early leaves emission during blooming period

Reduction of plants vigor and productivity

TRANSFER OF RESISTANCE FACTORS

Chip Budding



recovered (non-symptomatic) source

Grafting with intermediate

Programma di Sviluppo Rurale dell'Emilia-Romagna 2014-2020

L'Europa investe nelle zone rurali

Rural Development Plan 2014-2020
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CRPV soc. coop. CENTRO RICERCHE PRODUZIONI VEGETALI

TITLE: SOS FRUTTA - Environmentally friendly innovative crop protection strategies, residual mixtures management and updates on water needs for a sustainable fruit production.

Project Leader	ASTRA
Duration (29 months)	15.04.2016 - 14 .09.2018
Budget	*€ 365,233*
Research Partners (6)	Astra, Univ. of Bologna, CRPV , CNR-IBIMET, Proambiente, CER,
Farms and Farmers Organizations (12)	Apofruit, Apoconerpo, Conserve Italia, Cereali Padenna, Terremerse, Orogel, CAV, Agrintesa, Granfrutta Zani, Az. Punto Verde, Az. Pedriali, Az. Zoffoli, Az. Bianchi

This plan has the OBJECTIVE to bring innovation in the production of pome- and stone-fruits in integrated and organic farming TOWARDS A MORE SUSTAINABLE AGRICULTURE

LOW IMPACT PRODUCTS/TECHNIQUES FOR CROP PROTECTION

NEW TOOL FOR WASTEWATER RECYCLING

INFO TO UPDATE WATER NEEDS OF FRUIT CROPS

Rural Development Plan 2014-2020
Meas. 16.01 – FA 4B, Pr. SOS FRUTTA

A simple prototype to reduce pollution produced by agricultural wastewater (washing of sprayer) on soil and water and to recycling the final solution

A.O.P. (Advanced Oxidation Processes) technology based on **UV radiations** that with a catalyzer develop an OH radical which is the **oxidant agent** of aromatic molecules in solutions with pesticide.

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TRIALS	Active ingredient (a.i.) with high risk of impact	Alternative a.i./technique evaluated (less impacting)	Reduction of impact on water					Reduction of impact on environment					Reduced anount of a.i.
			Standard strategy (DPI)		Advanced strategy		Reduction (quantitative estimation)	Standard strategy		Advanced strategy		Reduction (quantitative estimation)	Comparison Standard strategy / Advanced strategy
			no. Sprying	kg/Ha	no. Sprying	kg/Ha		no. Sprying	kg/Ha	no. Sprying	kg/Ha	kg/Ha	
Peach & Apricot, bacteria (Xanthomonas sp.)	Cupper		-	-									20%
		Poliglucosammine	-	-									
		K and Al Sulphate (LMA)											
Peach, Monilinie	Tebuconazole												
		Fludioxonil											
Cherry, Monilinie	Fenbuconazole												
Apple, Eriosoma lanigerum	Clorpirifos												
	Thiamet												
Peach, Forficula auricolaria	Deltameti												
	Etofenprox												
Pear, Hoplocampa (Tentredin)	Acetamiprid												
		Spinosad										-	
		Piretro										-	
Pome fruit (moth, etc)	Clorantranilprole										-	-	50%
	Phosmet	Exclusion net								0	0	1,5	
	Thiacloprid										-	-	
	Etofenprox									-	-	-	
Apricot, Capnodis	Spinosad								0,144	0	0	0,144	
	Spinetoram							0	0	1	0,1	-	
Apple, Venturia inaequlis (Scab)	Pirimetanil + Dithianon		-				-	3	1,5	2	1	0,5	
Stephanitis pyri (Tingidae)	Piretro							4	0,214	3	0,16	0,054	
		Piretro + Essential oil of sweet orange	-		-	-	-	-	-	3	12	-	

Evaluation of alternative products and/or techniques TO REDUCE THE USE OF MORE IMPACTING ACTIVE INGREDIENTS (a.i.) ON WATER AND ENVIRONMENT

Based on the results we will try to extimate some quantitative effects following the substitution of more impacting a.i. with alternatives found.
For example in terms of :
- Quantity (kg/Ha)
- Number of spraying (%)
- Efficacy improvement (%)

Programma di Sviluppo Rurale dell'Emilia-Romagna 2014-2020

UNIONE EUROPEA — Regione Emilia-Romagna — L'Europa investe nelle zone rurali

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CRPV soc. coop. CENTRO RICERCHE PRODUZIONI VEGETALI

TITLE: RESISTANCE - Diagnostic techniques, spatial distribution and management of resistances of the main plant pathogens, insect pests and weeds towards plant protection products

Project Leader	CRPV
Duration (36 months)	01.09.2016 - 31.08.2019
Budget	€ 343,608
Research Partners (5)	CNR-IBAF, Univ. of Bologna, Univ. of Piacenza (UCSC), Univ. of MO-RE, CRPV
Farms and Farmers Organisations (8)	Terremerse, Cereali Padenna, Apofruit, Apoconerpo, Granfrutta Zani, Soc. Ag. CAB Massari, Az. Zoffoli, Az. Bianchi

This plan has the OBJECTIVE to evaluate resistance development by pest and diseases to pesticides in order to prevent it and to reduce water contamination and sanitary risks for farmer and general public.

RESISTANCE DIAGNOSTIC TOOLS

CHARACTERIZE THE REDUCED EFFICACY DETECTED IN THE REGION

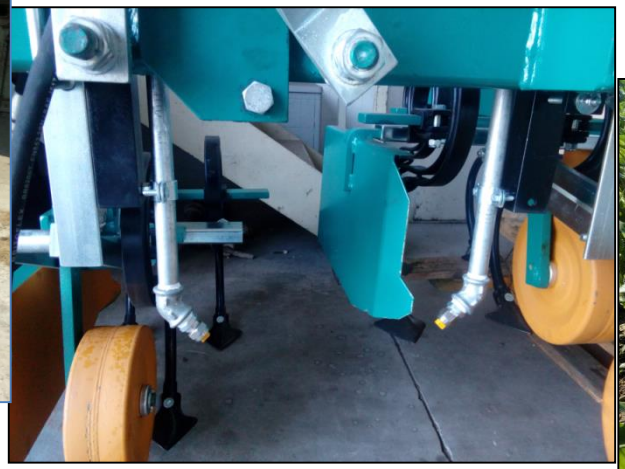
RESISTANCE MANAGMENT STRATEGIES ADOPTION

Prototype for herbicide band application and inter-row cultivation in maize using RTK-GPS systems

PRECISION AGRICULTURE: Based on precise satellite navigation technique for positioning (RTK/GPS) and tractor with auto-steering systems

LOW WATER/ENVIRONMENTAL IMPACT: Reduces herbicide dose of 50-66%

FLEXIBILITY: Usable from 2 to 6-leaf crop stage



Rural Development Plan 2014-2020
Meas. 16.01 – FA 4B

TITLE: SOS VITE - Application of sustainable techniques and methods for crop protection, irrigation and nutrition in viticulture

Project Leader	CRPV
Duration (36 months)	15.04.2016 - 14 .04.2019
Budget	€ 377,933
Research Partners (5)	Univ. of Bologna, ASTRA, CREA-VIT, CER, CRPV
Farms and Farmers Organisations (8)	Cereali Padenna, CEVICO, Cantine Riunite & CIV, Cantine S.Martino, Az. Pirondi, Az. Torregiani, Az. Gregorini, CAB Campiano

This plan has the OBJECTIVE to support the regional viticulture at both agronomical and phytosanitary level improving sustainability of the cultivation system also considering climatic changes

NEW METHODOLOGY TO IMPROVE NUTRITION MANAGEMENT

IMPROVEMENT OF GRAPEVINE PROTECTION STRATEGIES

UPDATING OF DATABASE FOR WATER NEEDS TO OPTIMIZE IRRIGATION

Rural Development Plan 2014-2020
Meas. 16.01 – FA 4B

Evaluation of correlation among analysis data of nutritional status of soil, of leaves and the quality/quantity of grapes produced by the 5 most important varieties in E.R. Region in 5 representative areas (in tot. on 25 farms) → to define a new Methodology

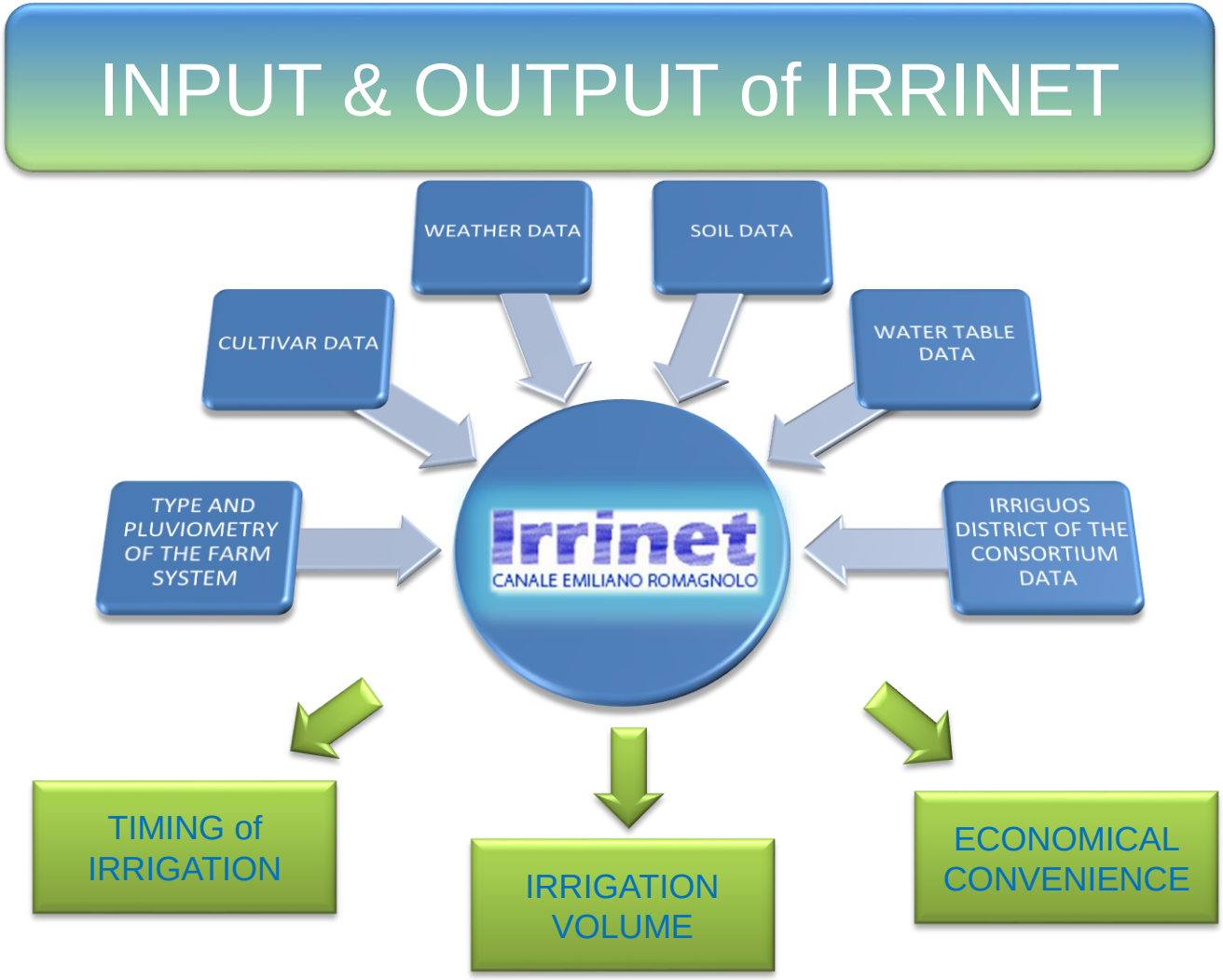
Validation of an easy and innovative methodology for farmers of a specific area to define objectively and punctually the actual status (optimum, shortage and excess) of nutrients in vineyard

OPTIMIZATION AND RATIONALIZATION OF FERTILIZATION PLANS IN ORDER TO REDUCE SOIL INPUTS AND WATER POLLUTION

UPDATING of phenological parameters to calculate IRRIGATION need of grape CVs for IRRINET DSS

Soglia superiore %	Soglia intervento %	Descrizione fenofase	Ordine	Consiglio irriguo	Somma Termica (gradi)	Kc	Stop crescita radicale	Fabbisogno N %	Intervento N Kg/h	Riserva N %	Fabbisogno P2O5 %	Intervento P2O5 Kg/h	Riserva P2O5 %	Fabbisogno K2O %	Intervento K2O Kg/h	Riserva K2O %
45,0	85,0	gemme in riposo invernale	1	False	0	0,45	True									
45,0	85,0	rigonfiamento gemme: fase piena	2	True	275	0,55	True									
45,0	85,0	apertura delle gemme: fase piena (> 50%)	3	True	28	0,60	True									
45,0	85,0	bottoni fiorali separati: fase piena (> 50%)	4	True	358	0,60	True									
45,0	85,0	allegagione: fase piena (> 50%)	5	True	454	0,60	True									
35,0	75,0	sviluppo grappolo: fase piena (> 50%)	6	True	551	0,60	True									
35,0	75,0	invaiatura: fase piena (> 50%)	7	True	563	0,60	True									
45,0	85,0	maturazione: fase piena (> 50%)	8	True	401	0,50	True									
45,0	85,0	caduta foglie: inizio fase (0-5%)	9	False	354	0,00	True									
45,0	85,0	caduta foglie: fase piena (> 50%)	10	False	238	0,00	True									
45,0	85,0	riposo vegetativo	11	False	30	0,00	True									

DSS for IRRIGATION



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ADVICE

CRUSCOTTO IRRIGUO di IrriFrame

Il cruscotto permette di tenere sotto controllo le esigenze irrigue di tutti gli appezzamenti registrati e di accedere con pochi click alle diverse funzionalità del sistema

Aziende/Appezzamenti — Creazione guidata nuovo appezzamento/coltura >

Localizzazione appezzamenti

CONSORZIO BONIFICA RENANA Assistenza >

Az. Agr. Bau >

	Clicca sul link per il menù	Descri	consumo oggi (mm)	data prevista irrigazione	volume irriguo (mm)	durata irrigazione (ore:minuti)		
1	ALBICOCCO	Cortile	3,96	Oggi	16,2	2:02	Dettaglio >	Ho irrigato >

CONSORZIO DI BONIFICA ADIGE PO Assistenza >

Azienda non assegnata

	PATATA	Descri	consumo oggi (mm)	data prevista irrigazione	volume irriguo (mm)	durata irrigazione (ore:minuti)		
2	ALBICOCCO	orto	4,06	Oggi	16,3	13:00	Dettaglio >	Ho irrigato >

IRRIGATION CONFIRMATION

CROP

HOW MUCH TO IRRIGATE

WHEN TO IRRIGATE

WATER REQUIREMENT

All OGs include also an intensive activity of dissemination (field visits, technical meeting, campus cloud, papers, etc.) addressed to all stakeholders of the supply chains.

Brussels, 11th April 2018

Thank you for your attention!!

mgtommasini@crpv.it www.crpv.it

Brussels, 11th April 2018