PREV-AM

* **PREV-AM** is also marketed as **PREV-AM PLUS** and **PREVAM**

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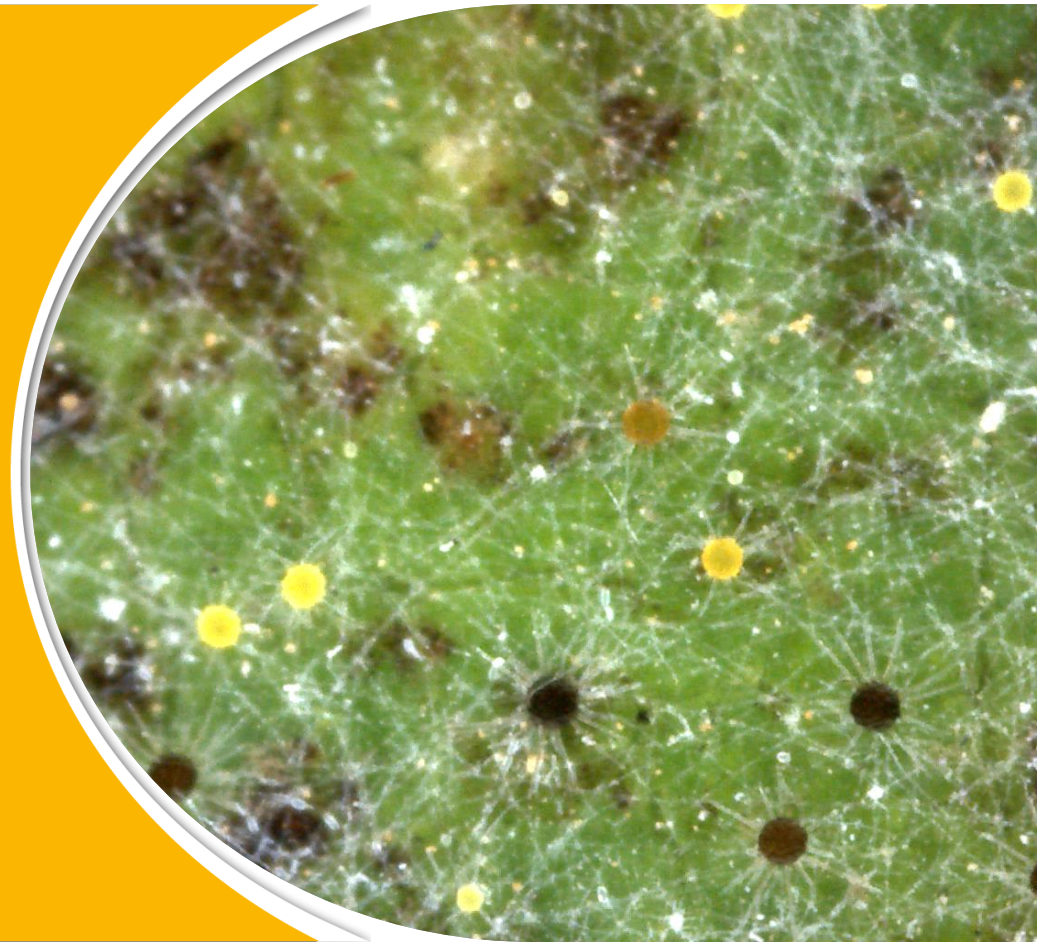
PREV-AM®

Multi strategies to control *Erysiphe necator* in vineyards



Onorio Gamberini, Sabino Lorusso - ORO AGRI BV

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Introduction

- The area of organic vineyards in the Mediterranean zone is constantly increasing. For example, in Italy, we estimate there is close to 100 000 hectares existing and in conversion.
- Consumers and retailers, supported by the media, show a definite preference for food & wine which is residue free or with limited MRL.
- The incidence of pests and diseases depends on the areas of cultivation, weather conditions and susceptibility of varieties. Due to climate change, the introduction of invasive pests and the development of resistances, **we need new efficient strategies to protect our grapes**.
- Powdery mildew (***Erysiphe necator***) is the key disease in many countries in EU being less influenced by rainfall in comparison to Downy mildew and Botrytis.
- In this context, ORO AGRI has carried out experimental activities on *Erysiphe necator* in order to identify a new strategy proposed in this presentation.

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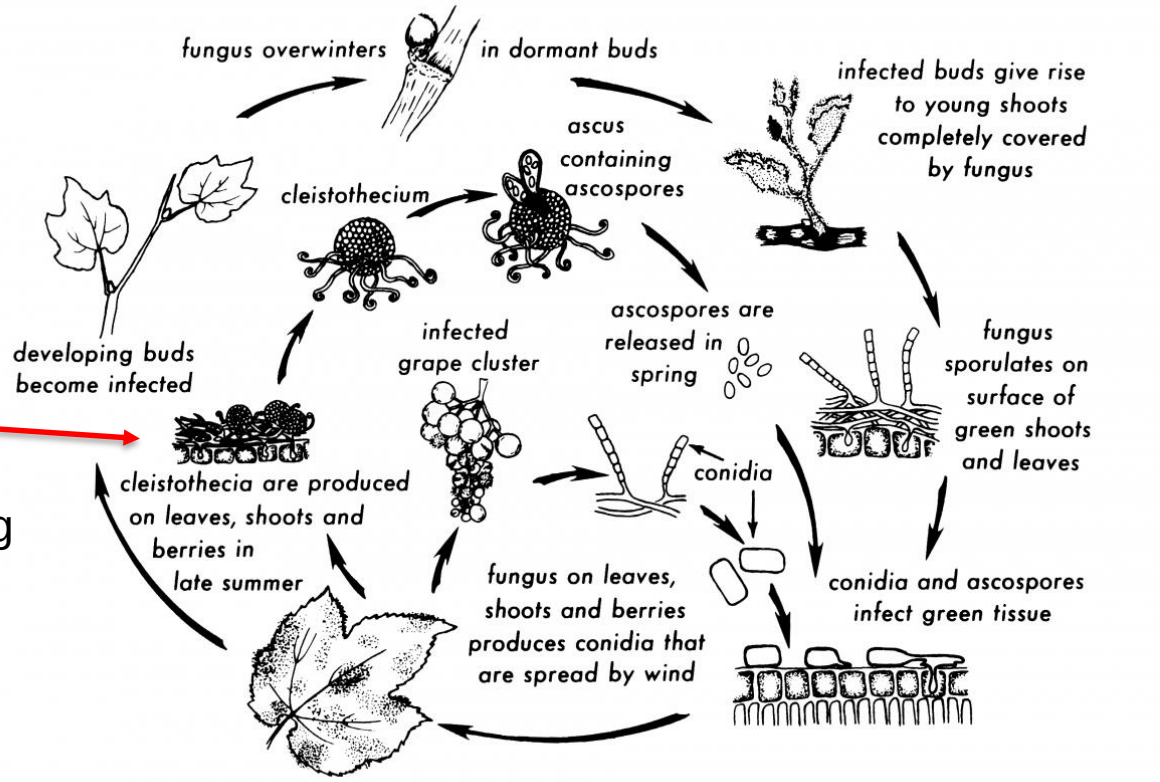
Life cycle of *Erysiphe necator* in Italy

Apulia region (**Italy**)
83.000 ha of wine grapes
25.000 ha of table grapes

Chasmothecia
(predominant overwintering form in Italy)



Source: Ohioline.osu.edu

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- Active ingredient: **Orange oil 60 g/l**
- Classification: 
- Broad spectrum **Fungicide & Insecticide MOA by contact - not affected by resistance**
- Authorized in many crops, targets and in organic cultivation
- Short REI and PHI
- **No MRL** (no residue)
- Compatible in strategies with beneficials and with organic and conventional farming practices
- **Effective immediately**, **irrespective of vegetative status of plants or weather conditions**

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Experimental trial - TERREMERSE Srl - cv Chardonnay Marzeno (RA) – Italy (*Standard grower approach*)

Trial code: TEF33016

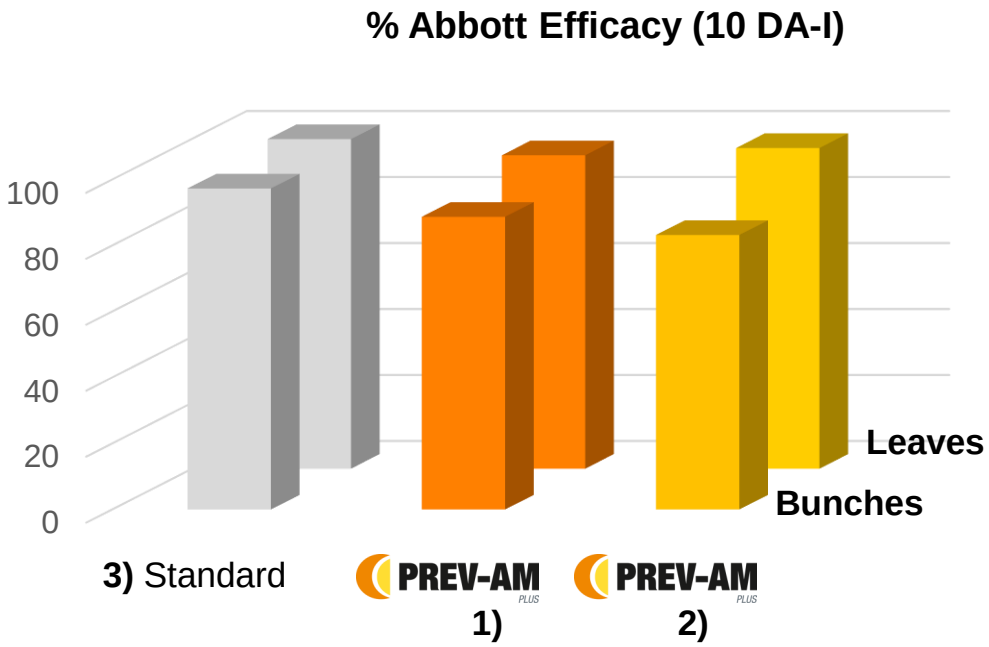
- In 2016 a GEP trial was carried out in a vineyard usually highly infected by powdery mildew. The objective was to compare organic strategies versus a conventional strategy.

1) PREV-AM PLUS (**ABCDEFGHI**) 400 mL/hL

2) PREV-AM PLUS (**AB**) 400 mL/hL → Sulphur WG 480 g a.i./hL (**CDEF**) → PREV-AM PLUS 160 mL/hL + Sulphur WG 160 g a.i./hL **(GHI)**

3) Tertaconazole (16 g a.i./hl - **ACE**) → Tebuconazole+Bupirimate 23,2+9,4 g a.i./hl - **GHI**)

Applications:
April (A 24th – **B** 27th)
May (**C** 5th – **D** 12th – **E** 20th – **F** 26th)
June (**G** 3rd – **H** 10th – **I** 17th /2016)



Infection severity in UTC (27th June)
Leaves **(52,8%)** - Bunches **(89,7%)**

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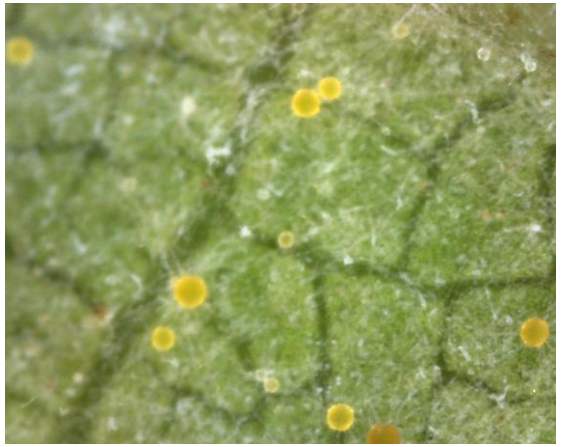
Experimental trial - AGROLAB Scarl - cv Aglianico Acquaviva delle Fonti (BA) - Italy (*Novel approach*)

ATTI *Giornate Fitopatologiche*, 2018, 2, 389-394

- In these trials, the efficacy on **chasmothecia** was tested and compared with the previous trial in order to get new information on the **mode of action and possibilities** of **PREV-AM** to control the pathogen at this stage.
- Trials were performed on large surface trial plots (**230 m²**) with repeated applications for two consecutive years. The first applications were made when the first immature chasmothecia appeared.
- The treated plots in autumn, were not protected on next spring with any fungicide effective against powdery mildew **until the 3rd week of June.** The intensity of infection of *Erysiphe necator* in each plot was measured.
- **2015** (3 applications: **A** *12th* - ***B*** *19th* *and* ***C*** *24th October*)
- **2016** (2 applications: **D** *8th and* ***E*** *15th October*)



Treatments:

1) PREV-AM PLUS 400 mL/hL
2) Mepthyldinocap 14 g a.i./hL

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PREV-AM Experimental trial - AGROLAB Scarl - cv Aglianico Acquaviva delle Fonti (BA) - Italy

ATTI *Giornate Fitopatologiche*, 2018, 2, 389-394 (*Novel approach*)

	Effect on Chasmothecia 2015			Effect on Powdery mildew 2016	Effect on Chasmothecia 2016			Effect on Powdery mildew 2017
	Number of chasmothecia / leaf		Evolution in %	Powdery mildew infection according to McKinney Index (Abbott efficacy) Bunches	Number of chasmothecia / leaf		Evolution in %	Powdery mildew infection according to McKinney Index (Abbott efficacy) Bunches
	12/10/2015	29/10/2015		22/06/2016	08/10/2016	22/10/2016		17/06/2017
	0 DAA	5 DAC		242 DAC	0 DAD	7 DAE		245 DAE
UTC	**17.9 a**	**326.1 a**	+ 1721%	**40% a**	**16.7 a**	**248.2 a**	+ 1386%	**27.4% a**
PREV-AM PLUS 400 mL/hL	**15.2 a**	**0 d**	- 100%	**3.5% c [91.3%]**	**4.7 b**	**0 d**	- 100%	**2.3% c (91.8%)**
Meptyldinocap 14 g a.i./hL	**14.9 a**	**127.2 b**	+ 753%	**36.1% a [9.8%]**	**13 a**	**32.9 c**	+ 153%	**6.3% b (77.2%)**

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Monitoring on chasmothecia formation (2019)

- To have optimum efficacy during fall treatments, it is necessary to make the first applications at a stage when chasmothecia is still yellow. Therefore, the monitoring was conducted to help farmers to identify the best timing for the sprays and strategy.
- Sixteen vineyards of table and wine varieties (seeded and seedless) were selected: ***Italia*, Victoria***, *Scarlotta, Apirena,* ***Aglianico****, Allison,* ***Red Globe****, Crimson,* ***Black Pearl****, Sugraone* and *Sugar Crisp*
- The level of presence of chasmothecia was checked weekly and classifed related to their stages: **5** classes and **9** subvalues

0	Absence
1	Rare presence of developing chasmothecia
2	Significant presence of developing chasmothecia
3	High presence of developing chasmothecia and are close to maturation
4	Good presence of mature chasmothecia

***** Seeded varieties

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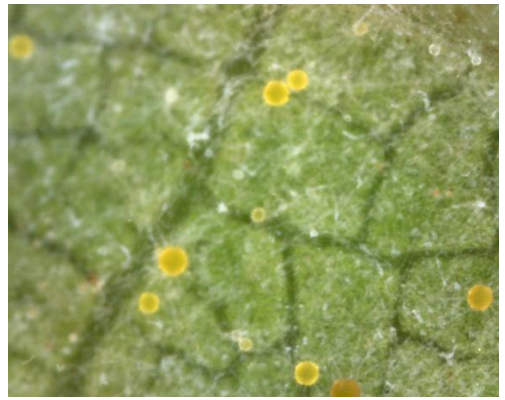
PREV-AM Monitoring on chasmothecia formation (2019)

- The 4th week of September 2019 was the first stage at which chasmothecia was detectable at the majority of the sites. Complete maturation was observed by early November.
- The hyphae from which the chasmothecia are formed **appear thin and stringy**.
- The very strong activity of **PREV-AM** on chasmothecia is probably due to the desiccation of hyphae and immature fruiting bodies.
- Monitoring is continuing in 2020 in the same areas which were checked in 2019.
- The applications should start before the colour change of chasmothecia.



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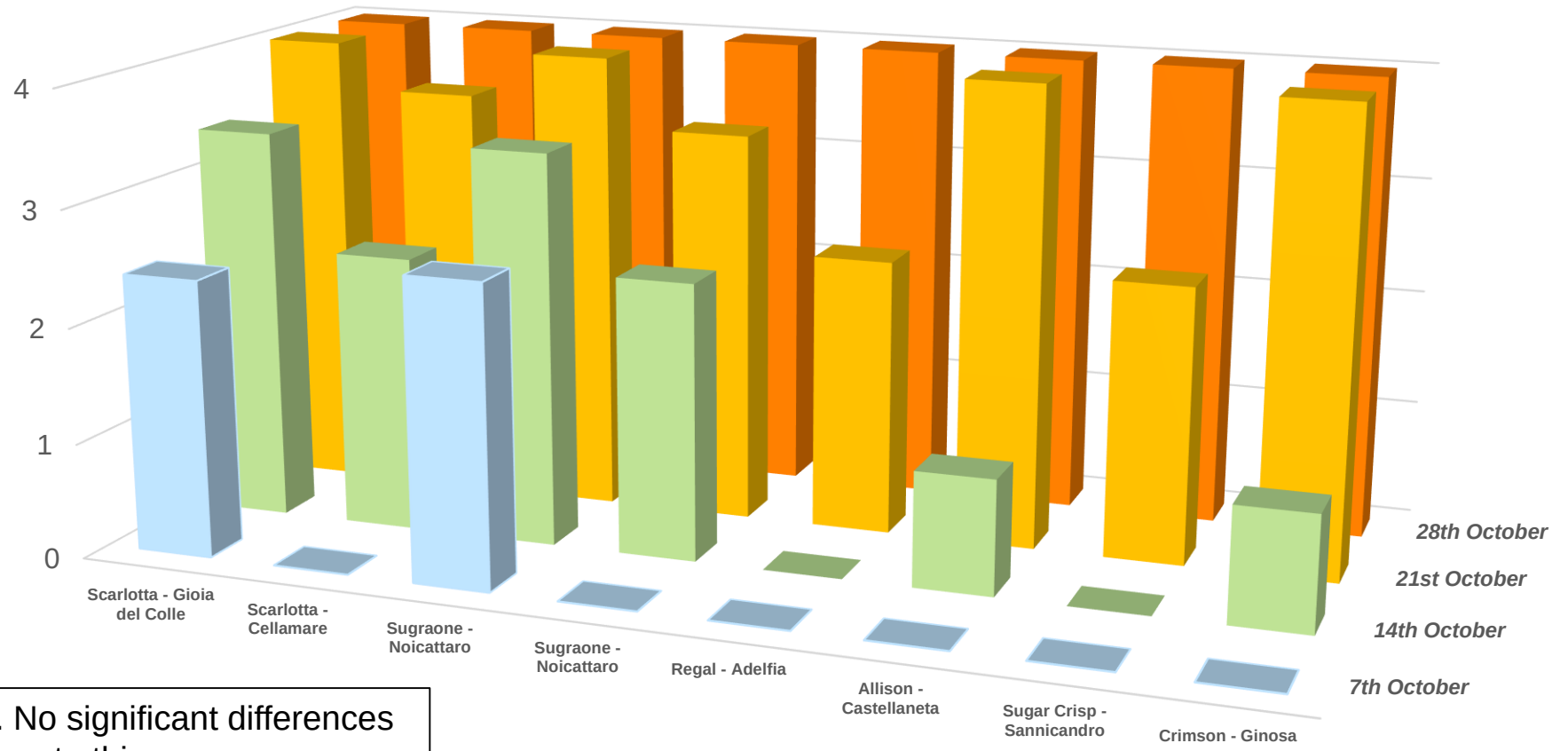
PREV-AM Monitoring on chasmothecia formation (2019)

Seedless table grapes
(evolution timing)



16 sites in total were monitored. No significant differences in the other varieties in comparison to this survey

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Summary

- **PREV-AM** has been shown in experimental tests and field applications to be an effective fungicide against *Erysiphe necator,* valid not only for organic cultivations but also in conventional.
- Applications focused on reducing chasmothecia formation in fall may lead to a reduction of incidence of *Erysiphe necator* in the following season. This strategy could reduce the number of applications in spring/summer in vineyards where powdery mildew is recurs regularly.
- **PREV-AM** is a versatile solution to control different pathogens and application timing on grapes (eg. *Erysiphe necator, Plasmopara viticola etc.*). **It works independently of plant or weather conditions.**
- The data gathered in our monitoring are available in our website as useful technical indications for growers and technicians. See www.oroagri.eu.

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Conclusion and Perspective

- **PREV-AM** is permitted for use in organic farming in many EU countries, leaves no residue, disease resistance is unlikely, is environment friendly and is a useful solution to protect grapes globally.
- **PREV-AM** may be applied **stand alone** as an eradicant to reduce chasmothecia density in **fall** or to control primary infections **pre-blooming in spring**. The strong physical action of **PREV-AM** on hyphae forming chasmothecia reduces these fruiting bodies and a significant delay in the outbreak of disease in following season is possible.
- A tank mix **of PREV-AM** with **low doses of sulphur** from **berry set to berry touching** stage may be exploited for better bunch protection when high foliage density covers the bunch. The vapour action of sulphur is complementary to the mode of action of **PREV-AM.**
- A fall application of **PREV-AM** may be an interesting complementary strategy to **reduce the inoculum**, **delay the primary infections and therefore reduce the need of PPP during the main vegetative period.**

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