How I implement IPM

Details of a holistic IPM strategy with low pesticide input in a European farm

My farm

Herdade dos Grous
Albernoa, Beja
(Portugal)

PEDO-CLIMATIC CONTEXT

- Loamy-clayey and clayey-sandy soil with low fertility and medium water retentiom
- Csa type climate: temperate Mediterranean climate with hot and dry summers
- Organic matter added annually in about 20% of the area (rotational)
- Average annual precipitation: 530 mm

MAIN PESTS

- Main weeds: Conyzas, malvas and grass
- Main pests: Green leafhopper and aphids
- Main diseases: Downy mildew, powdery mildew, scale, scoria - wood

AGRONOMICAL CONTEXT

- Varieties in the vineyard: Touriga Nacional, Alicante, Syrah, Aragonez, Trincadeira, Tinta Miúda, Arinto, Alvarinho, Sousão, Touriga Franca, Viosinho, Alfrocheiro, Roupeiro, Antão Vaz, Encruzado
- Regenerative agriculture and biological techniques
- Diversified farm: Vineyards (133 ha), olive grove, permanente grassland, animal production

SOCIO-ENVIRONMENTAL CONTEXT

- Integrated production practices, buffer strips, pollinator mixtures, installation of nests for bats and birds and perches for birds of prey
- Permanent labour for more demanding work (e.g. pruning), sporadic hiring of seasonal labour
- Certified permanent grassland (cattle, sheep and goats) and horticulture; and quality certifications: ISO 14001, ISO 9001, Sustainable Wine Production (PSVA referential), FSC

OBJECTIVES AND MOTIVATIONS OF THE FARMER

- Making farming more sustainable and more resistant to climate change
- Integration of the agricultural activity into the surrounding landscape
- Less dependence on external factors, such as reducing the need of organic material
- Improve conditions for employees and surrounding community

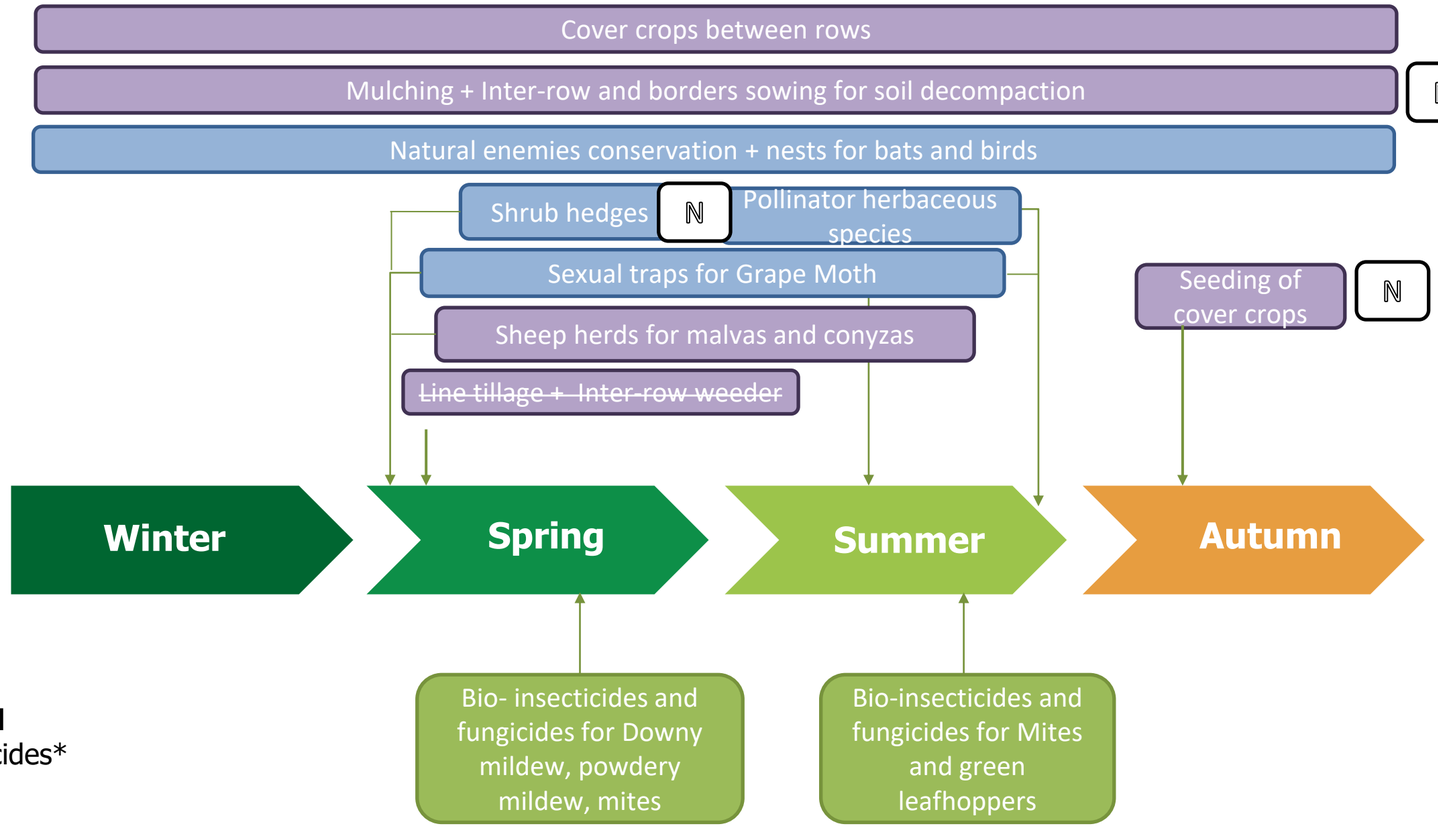
My strategy

Alternative solutions

Agronomical

Genetics

Physical control



Chemicals and biocontrol

Insecticides and other pesticides*

Fungicides*

Herbicides*

*In green = low risk PPPs

* In blue = biocontrol agents

Biologic products: fungicides,insecticides & algae

~~Herbicides and mineral fertilisation~~

Key measures

Have not used herbicides for more than 5 years

Over the years there has been a reduction in the use of shredders and inter-row weeders. Use of sheep herds instead, with great results for *Conyza spp* and *Malva spp*

Cultivation of borders and between lines with subsoiler passes (key line) to decompact the soil

There is permanent cover crops between rows and in the borders of the fields (natural and sown) with multiple goals: soil structure and water retention, shelter for beneficals,...

Planting of shrub hedges, pollinator mixtures, installation of nests for bats and birds and perches for birds of prey

Legend N **New solution** ~~**Solution**~~ **Abandoned solution** **Non systematic solution**

My results

Evolution trend on the farm

Pests control

Very good	Medium	To improve
General weeds	Mallow /Malva *Conyza spp* Aphids Mites	Green leafhopper

Evolution of use of pesticides

Very good	Medium	To improve
Fungicides Insecticides Herbicides	Biocontrol	

Sustainability indicators

Very good

- ↘↘ Use of products that are dangerous or toxic to the environment, user and consumer
- ↘↘ Use of synthetic or chemical fertilizers
- ↗↗ Establishment of grass cover or multi-annual crops
- = Distribution of work over the year
- ↗ Real gross product with self-consumption
- ↘↘ Pesticides costs

Medium

- ↗ Use of sustainable energy
- ↘ Irrigation (amount of water)
- ↗↗ Use of control by bio-conservation [landscaping]
- ↗↗ Level of overall satisfaction of the farmer and his entourage
- ↗ Workload
- ↘↘ Actual mechanization load
- ↗ Complexity of the cropping system
- ↗ Labour employment
- ↘ Drudgery of work
- ↘↘ Energy costs

To improve

- ↘ - Use of fossil energy
- ↗↗ - Diversity of species in rotation

Key conclusions

Due to IPM and other techniques, the cultivation system has become more and more technical over time, which has added complexity

The farm has become less dependent on external factors as they no longer use herbicides nor pesticides, only biologic products

Although vine is a permanent crop, it has been integrated with different vegetation covers, permanent grazing and other plant structures such as shrubs and flowers, which improves the biodiversity of surrounding areas

Most pests are very well managed using mainly biological, cultural and mechanical practices

Legend

In green = positive trend
In red = negative trend
In black = comparable

= **Comparable**

↗ **Increase**

↘ **Decrease**

↗↗ **Significant increase**

↘↘ **Significant decrease**

Environmental indicators
Social indicators
Economical indicators

Our feedbacks

"The biggest difficulties are the immediate production losses and the adaptation of crops to new cultural practices, but at medium-term improvements are notorious, such as the increase of biodiversity and the reduction of weeds, as can be observed after the entry of sheep in vine. More initiatives like IPMWORKS should be boosted in order to promote knowledge sharing among producers"

Filipa Almeida - Herdade dos Grous (Portugal)

"Nowadays there is a huge need to search for solutions to minimize the use of PPP and control the expected higher incidence of pests and diseases, resulting from climate change. This need is shared by Herdade dos Grous, who has successfully been finding alternative solutions to not only make the farm more resilient, but also more sustainable, by integrating it into an agro-forestry mosaic increasingly less dependent on external inputs"

Bárbara Castro (Portugal)

Main objective of the farmer/company

- Adapt agricultural practices to climate change and incorporating them into the surrounding landscape, in order to implement a more sustainable and "risk-free" agriculture

Advantages of the system

- Less dependence on external factors by replacing herbicides with more innovative and sustainable techniques, which are environmental harmless
- More access to environmental certifications linked to the sustainability of the grapes produced with positive consequences on the promotion of the wines

Disadvantages of the system

- New techniques may require more skilled labour, a resource that is very scarce today, especially in the farm region (Alentejo)
- Practices that lead to additional production costs and huge crop adaptation at the beginning

Opportunities to develop in the future

- Constant search for the latest biological control techniques
- Restructure the vineyard with more resistant and better adapted varieties, new compasses, exposure and plantations following a "Key Line" methodology
- Increase the levels of organic matter to improve soil fertility and health
- Decrease soil compaction and reduce the use of machinery
- Continue to work on soil cover crops and bio-conservation: what species to use for different objectives
- Increase the management and control of the green leafhopper pest
- Involve the local community in agronomic activities

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