



Member Training (Vineyard)

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*Adapted from IOBC Guidelines for Integrated Production of Grapes, 2nd Edition, 1999





INTRODUCTION

This training document serves as a basic foundation of sustainable grape growing as viewed through the concepts of *Integrated Production*. The main sources of more detailed information are the *LIVE Checklist* and the *LIVE Green and Yellow List*. These can be downloaded on our website, livecertified.org.

Please review this annually.

DEFINITION OF INTEGRATED PRODUCTION IN VITICULTURE

The economical production of high quality grapes, giving priority to ecologically safer methods, minimizing the undesirable side effects and use of agrochemicals, to enhance the safeguards to the environment and human health

OBJECTIVES OF INTEGRATED PRODUCTION IN VITICULTURE

To promote viticulture that respects the environment, is economically viable, and sustains the multiple functions of agriculture, namely its social, cultural, and recreational aspects

To secure a sustainable production of healthy grapes of high quality and with a minimum occurrence of pesticide residues

To protect the farmers' health while handling agro-chemicals

OBJECTIVES OF INTEGRATED PRODUCTION IN VITICULTURE

To promote and maintain a high biological diversity in the ecosystem of the vineyard and in surrounding areas

To give priority to the use of natural regulating mechanisms

To preserve and promote long-term soil fertility

To minimize pollution of water, soil, and air



PROFESSIONALLY TRAINED GROWERS

Vineyard managers participating in LIVE must be trained annually in all aspects of Integrated Production by attending locally organized training courses or reviewing the document you are currently reading

Growers should have a thorough knowledge of the aims and principles of Integrated Production and of LIVE guidelines and standards

Members should have a positive and sympathetic attitude to environmental conservation and human health and safety



CONSERVING THE VINEYARD ENVIRONMENT

A balanced and natural vineyard environment with a diverse agro-ecosystem of plants and animals must be created and conserved

At least 5% of the farm must be dedicated to Ecological Infrastructures

- Non-inputs of agrochemicals

- Promote biodiversity of flora and fauna

- Promotes beneficial insect habitat

Green cover in winter is mandatory (other types of cover are allowed in areas with less than 15 inches of rain per year). Permanent green cover is encouraged.

Alternating mowing regime leaves a food source for beneficial fauna and conserves fuel

Trout lilies growing in vineyard alleyway



Native forbs growing in vineyard alleyway

Examples of Vineyard Floor Biodiversity



PLANTING NEW VINEYARDS

Frost pockets and poor drainage should be avoided

Disease resistant and diverse cultivars, rootstocks, and clones should be chosen

Certified plant material should be used

PLANTING NEW VINEYARDS

Training systems

Preference must be given to training systems facilitating the application of cultural (non-chemical) techniques favoring:

Vine longevity

Biological diversity (botanical and zoological)

The protection of soil against erosion

Reduction of conditions favorable for the development of insect pests and diseases

A more efficient application of pesticides and reduction of the amount of pesticides applied



SOIL MANAGEMENT AND NUTRITION

Soil Analysis and Preparation

Soil analysis should be done to learn the texture, organic matter, and macronutrients

Basic fertilization with organic and/or mineral components if necessary

Thorough elimination of sources of disease inoculum (i.e. roots of old vines)

Control of perennial problem weeds by rotating methods to avoid weed shifts or resistance



SOIL MANAGEMENT AND NUTRITION

Structure, depth, fertility, fauna and micro-flora of the soil must be conserved and nutrients and organic matter recycled where possible.

Maximum nitrogen application and period of application are defined regionally. See *LIVE Green and Yellow Lists* for details

Reduce nitrogen whenever possible to minimize leaching

Application of P and K should not exceed 10% of the recommended amount given in the soil/plant analysis

Foliar sprays should be calculated and formulated to match the deficiency problem as shown in soil and tissue tests

ALLEYWAYS AND WEED-FREE STRIP

Aim to avoid soil erosion and compaction without detriment to yield and quality

Maintain and enhance plant species diversity in the vineyard in order to increase ecological stability

Minimize the use of herbicides

- Use of cultivation where appropriate

- Green cover

- Rotation of modes of action (MOA) and methods of weed control

IRRIGATION

Irrigation must be applied according to need
(vine symptoms, ET data, etc.)

Excessive soil moisture may result in leaching
of nutrients and is wasteful

Irrigation after véraison is restricted to the
maintenance of plant health and promotion of
fruit quality



Monitoring soil moisture and ET are needed to determine when and how much to irrigate. *Photo by Patty Skinkis*

CANOPY MANAGEMENT

Grapevines must be trained and pruned to achieve a balance between growth and regular yields, and to allow good penetration of light and sprays.

Proper ventilation of the grape zone in humid areas is an important and mandatory prophylactic measure against diseases (especially *Botrytis cinerea*).

INTEGRATED PLANT PROTECTION

All available cultural prophylactic measures (indirect plant protection) must be applied before or concurrently (as is appropriate) to direct control measures are used

At least two key beneficial insects must be protected and encouraged. This will depend on your region.



INTEGRATED PLANT PROTECTION

Indirect Plant Protection

Resistant rootstocks and appropriate cultivars

Appropriate choice of planting and training systems

Avoidance of excess nitrogen

Canopy management

Green cover

Beneficial insects

INTEGRATED PLANT PROTECTION

Risk Assessment and Monitoring

Populations of pests and diseases must be monitored and recorded regularly

Approximate infestation levels are determined

Decision to use direct plant protection must be based on thresholds of existing and validated forecast models



INTEGRATED PLANT PROTECTION

Direct Plant Protection

Priority must be given to natural, cultural, biological and highly specific methods of pest, disease and weed control, and the use of agrochemicals must be minimized

Use of pesticides only when justified – most selective, least toxic, least persistent product or control procedure, which is as safe as possible to humans and the environment, must be selected. See LIVE *Green and Yellow Lists*



INTEGRATED PLANT PROTECTION

Selection of Pesticides

Pesticides are evaluated by LIVE Technical Committees on a regular basis based on the following criteria

- Toxicity to humans

- Toxicity to key beneficial fauna and other natural organisms

- Pollution of ground and surface water

- Selectivity

- Persistence

- Incomplete information on the pesticide



INTEGRATED PLANT PROTECTION

Materials that are not permitted

Pyrethroid insecticides and acaricides

Organochlorine insecticides and acaricides if safer alternatives exist

Acaricides toxic to beneficial mites

Toxic, water polluting or very persistent herbicides (eg. Diquat, Paraquat)

Copper as a fungicide (as of 2015)

Materials on Salmon-Safe *High Hazard List*



INTEGRATED PLANT PROTECTION

Materials that are permitted with restriction (See LIVE Green and Yellow List)

Broad-spectrum organophosphate and carbamate insecticides

Acaricides moderately harmful to Phytoseiid mites

Targeted fungicides that show low residual persistence but high efficacy
(maximum of 3 applications per season and not in succession, so that predatory
Phytoseiid mites are not affected)

Sulfur (use must be limited so that predatory Phytoseiid mites are not affected)

Residual herbicides with $dt_{90} < 1$ vegetation period



EFFICIENT AND SAFE SPRAY APPLICATION METHODS

Spraying equipment and spraying conditions minimizing the health risk of the operator and drift are preferred

Sprayers have to be calibrated annually by the grower and serviced by a recognized agent at least every four years.

When new sprayers are purchased, low pressure/high volume or tunnel sprayers should be selected where possible.



SALMON-SAFE

Certification in first year of membership if farm is in compliance

Inspection is included at no extra cost and is performed simultaneously with LIVE inspection

Salmon-Safe High Hazard List available on livecertified.org





THIRD-PARTY INSPECTION

Vineyard members are visited in years 1 and 2 and every 3rd year thereafter (For winery program, year 1 and every 3rd year thereafter)

Inspection fee is only billed in years inspected

Inspector looks for compliance with LIVE standards

- Checklist review

- Mandatory recordkeeping is audited

- Vineyard walk (virtual during COVID)

- Biodiversity and ecological infrastructures



REPORTING REQUIREMENTS

LIVE Checklist

Input Reporting

Pesticide Report

Fertilizer Report

Irrigation Report

A map outlining and inventorying your ecological infrastructures

Any other supporting documentation requested by the inspector, including soil, tissue, irrigation water tests, sprayer calibrations, etc.



REPORTING REQUIREMENTS

All documents to be completed on livecertified.org

Annual deadline of December 10th for vineyard members and February 10th for winery members

Each property is eligible for certification after two years of membership (vineyard) or one year of membership (winery)