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IOBC/WPRS
Commission "IP-Guidelines and Endorsement"

OILB/SROP
Commission "Directives de PI et Agrément"

GUIDELINES FOR INTEGRATED PRODUCTION OF GRAPES

IOBC Technical Guideline III
2nd Edition, 1999

Edited by C.Malavolta & E.F. Boller

IOBC wprs Bulletin
Bulletin OILB srop Vol. 22 (8) 1999

The IOBC/WPRS Bulletin is published by the International Organization for Biological and integrated Control of Noxious Animals and Plants, West Palaeartic Regional Section (IOBC/WPRS)

Le Bulletin OILB/SROP est publié par l'Organisation Internationale de Lutte Biologique et intégrée contre les Animaux et les Plantes Nuisibles, section Régionale Ouest Paléarctique (OILB/SROP)

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Address General Secretariat:

INRA – Centre de Recherches de Dijon
Laboratoire de Recherches sur la Flore Pathogène dans le Sol
17, Rue Sully – BV 1540
F-21034 Dijon Cedex, FRANCE

ISBN 92-9067-113-0

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Preface of 2nd edition

Why a second edition of the technical guideline III for Integrated Production in Viticulture published in 1996?

At the occasion of the 8th General Assembly 1997 IOBC Council reviewed the activities and progress of its Commissions and Working Groups.

With respect to the Commission „IP-Guidelines and Endorsement“ Council did not only take note of the successful progress of the endorsement procedure for regional IP-organisations but also requested that all IOBC guidelines for Integrated Production have to meet a uniform quality standard set by the 2nd edition of the IOBC guidelines on pome fruit published in 1994. That particular document does in deed provide orientation marks and can be considered a useful model not only with respect to the formal structuration of a crop specific guideline but also with respect to the standards of minimal requirements to be reached by national or regional IP-organisations seeking IOBC endorsement. It is evident that official IOBC guidelines for Integrated Production not only had to provide the necessary crop specific basis for the IOBC endorsement procedure but follow a general concept set by IOBC.

Council and Commission realised that this objective was difficult to achieve without precise guidance given to the various working groups and expert panels preparing crop specific guidelines under the IOBC umbrella. The Council decided therefore to give its IOBC Commission „IP-Guidelines and Endorsement“ the mandate to co-ordinate and supervise the preparation of future guidelines and to define the procedures to be followed during guideline preparation. The Commission was also asked to initiate without delay an adaptation of the technical guideline for Integrated Production in viticulture published in 1996 that showed certain shortcomings concerning formal structuration and degree of specification.

The Commission has decided to use an expert system that has given high satisfaction already at earlier occasions. It consists of the establishment of a first draft of a guideline by a group of experts, making best use of all available information. This draft is then distributed for consultation among a wider range of experts active in IP-organisations, scientific institutions or IP-oriented extension services within the WPRS region.

In the case of the 2nd edition of this guideline notes taken during the preparation of the first edition were of special value as were the existing guidelines of advanced European IP programs already in operation, and last but not least the input of the more than 30 experts included in the consultation.

We would like to extend our thanks to all persons that assisted in the preparation of this document by their direct input and advice. Most of them have already participated in the discussions and meetings held for the preparation of the preliminary document published in 1996. Special thanks go to those colleagues who translated the English text of the original document into the respective other languages.

The final text of the 2nd edition was read and approved by the Commission on February 15, 1999.

Carlo Malavolta
Co-Editor
Member of Commission

Ernst F. Boller
Co-Editor
Chairman of Commission

GUIDELINES FOR INTEGRATED PRODUCTION OF GRAPES

IOBC TECHNICAL GUIDELINE III
1999. 2nd Edition

(Original text in English)

This document sets out revised general principles, minimum standards and guidelines for Integrated Production of grapes for wine production in the geographic areas covered by IOBC/WPRS. It is intended as a framework for the formulation of regional or national guidelines according to IOBC standards and to facilitate their harmonisation. The document on IOBC principles of Integrated Production and Technical Guidelines I and II, published in IOBC/WPRS Bulletin Vol. 16(1) 1993 or up-dated versions thereof, are integral part of these crop specific Technical Guidelines III.

1. Definition and Objectives of Integrated Production in Viticulture

In the frame of the general IOBC definition of Integrated Production, Integrated Production of grapes is defined as the economical production of high quality grapes, giving priority to ecologically safer methods, minimising the undesirable side effects and use of agro-chemicals, to enhance the safeguards to the environment and human health.

Based on this short definition Integrated Production of grapes emphasises the following **objectives**:

- 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;
- 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 minimise pollution of water, soil and air.

2. Professionally trained, environmentally and safety conscious growers

Successful Integrated Production requires professional, up-to-date training and a positive and sympathetic attitude to its aims.

The grape growers or responsible vineyard managers must be professionally trained in all aspects of Integrated Production by attending locally organised training courses. They should have a thorough knowledge of the aims and principles of Integrated Production and of regional IP-guidelines and standards. They should have a positive and sympathetic attitude to environmental conservation and human health and safety.

A requirement for attendance of an introductory training course offered by the IP-organisation as well as at regular updating and review meetings is mandatory.

Grape growers must be members of an officially recognised IP association. A contract has to be signed between each member and its IP-association that lists the obligations of the member defined by the Technical Guideline I.

3. Conserving the Vineyard Environment

An important aim and requirement of Integrated Production in viticulture is the conservation of the vineyard environment, its habitats and wildlife. They must not be detrimentally altered nor polluted.

A balanced and natural vineyard environment with a diverse agro-ecosystem of plants and animals must be created and conserved. According to IOBC standards at least 5% of the entire farm surface (excluding forests) have to be identified and managed as ecological compensation area with no input of pesticides and fertilisers in order to enhance botanical and faunistic biodiversity.

In areas with predominantly perennial crops and small farms, where a surface of 5% or more of a common and homogeneous agroclimatic unit (e.g. municipal district) has been set aside as ecological compensation area by official and well documented regional programs, the 5% rule has not necessarily to be applied to the individual farm. Important elements of ecological infrastructures are e.g. border areas and slopes of terraced plots rich in plant species, stone walls and ruderal areas. Particular attention must be devoted to headlands and hedges. High diversity of their composition and structure should be the aim, using or encouraging native species where possible.

A green cover during winter is mandatory. In areas with sufficient precipitations and adequate soil types the maintenance of a permanent or temporary green cover during the growth season is highly recommended. In areas with precipitations >500 mm during the growth season, it is recommended to increase biodiversity of high quality within the vineyards (e.g. by practising an alternating mowing regime with a permanent supply of flowering plants as food sources for the vineyard fauna).

National/regional guidelines have to require the implementation of at least two ecological options by each member farmer for the active enhancement of biological diversity and have to provide a list of possible options.

4. Site, Rootstocks, Cultivar and Planting Systems for New Vineyards

For new vineyards, site, rootstocks, cultivar, planting systems must be selected and harmonised so that regular yields of quality grapes, and hence economic success, can be expected with a minimum use of agrochemicals and environmentally hazardous practices. Frost pockets and poor drainage situations must be avoided. Cultivars and clones resistant to diseases and/or pests as well as a diversification of cultivars and rootstocks are recommended. Planting material should be sound and certified as virus-tested. Where this is not available then planting material of the highest health status available must be used. Narrow planting systems must be avoided whenever possible as they require in most cases soil management practises that are in contradiction to the aims of IP (e.g. total surface application of herbicides).

New plantations should respect a distance of at least 10m from surface water.

Training systems

For the choice of training systems preference must be given to training systems facilitating the application of cultural techniques favouring

- the production of high quality grapes;
- vine longevity;
- biological diversity (botanical and zoological);
- the protection of soil against erosion;
- a reduction of conditions favourable for the development of insect pests and diseases;
- a more efficient application of pesticides;
- a reduction of the amount of pesticides applied;
- the recycling of spray drift (e.g. recovery panels).

Very low training systems are not recommended.

Analysis and preparation of the soil prior to planting

The measures must consist of:

- soil analysis: texture, organic matter, macro nutrients (at least P, K, Mg);
- basic fertilisation with organic and/or mineral components if necessary;
- land improvement if necessary (e.g. drainage, increasing content of organic matter where below 1%);
- thorough elimination of sources of disease inoculum (i.e. roots of old vines);
- elimination of perennial problem weeds.

Large scale melioration (e.g. excavations and land-fillings) should be examined critically with respect of their environmental impact and destruction of a diversified topography and existing ecological compensation areas.

The "devitalisation" before removal of virus infested vines (fan leaf) is recommended. A fallow is highly recommended, if possible with flowering cover plants.

Chemical soil sterilisation is not permitted.

5. Soil Management and Nutrition

The structure, depth, fertility, fauna and micro-flora of the soil must be conserved and nutrients and organic matter recycled where possible. Restricted quantities of fertilisers consistent with high grape quality, plant health and the mineral and organic nutrient reserves in the soil may only be used if chemical analysis of soil or plant material shows they are justified. Ground water pollution with fertilisers, especially nitrates, must be avoided.

Whenever fertilisers are to be applied after planting, soil and/or plant analysis must be done on a regular basis to determine nutrient and fertiliser requirements. Regional or national guidelines must set out clear methods by which requirements are determined, including sampling and analytical procedures and rules for decision making.

The maximum permitted nitrogen input (expressed in kg N/ha/year and per ton of grapes harvested per ha) and period of application (e.g. from BBCH stage 15 until stage 68) must be defined in the guidelines. It is recommended that in established vineyards the maximum amount of nitrogen be set at 5 kg N (per ha and year) per ton of grapes harvested. In cases where green covers are established for the first time and therefore additional biomass has to be produced it is recommended to add to this calculated total amount of N during a period of 4-5 years an additional amount of 30-50 kg N/ha/year. The total amount of available nitrogen in organic fertilisers should be accounted for a period of 3 years. IP-growers should be stimulated to reduce the amount of nitrogen whenever possible to minimise leaching (e.g. by observation of the green coloration of the leaves. A dark-green colour of the leaves suggests in most cases that the nitrogen fertilisation can be reduced.)

The applied amount of K and P indicated by the soil or plant analysis should not exceed the indicated amount by more than 10% except for organic fertilisers applied every second or third year.

Where foliar symptoms indicate a deficiency of micronutrients these elements should be administered basically via the root system. Foliar sprays should be restricted to clearly defined and justified cases.

Fertilisers or manure contaminated with toxic or environmentally hazardous substances such as heavy metals or pathogenic micro-organisms are not permitted.

6. Alleyways and Weed-free Strip

The aims of establishing alleyways with cover plants are to avoid soil erosion and compaction without detriment to yield and quality, to maintain and enhance plant species diversity in the vineyard to increase ecological stability, and to minimise the use of herbicides.

Total green cover during winter is mandatory. The procedures for practical implementation must be defined in the guidelines according to climate, soil type and grape varieties.

Where soil moisture is adequate during the vegetation period overall bare soil management of vineyards is not permitted except in new plantations (maximum period of 3 years). The exceptional and highly restrictive use of herbicides with low persistence on the entire surface

of a plot must be defined clearly in the guidelines and can only be permitted during spring and summer months for certain situations (e.g. in existing narrow planting systems with row distances < 1.5 m and/or existing low training systems).

Where possible, the use of herbicides should be replaced by mechanical cultivation, soil cover with organic materials and above all by partial or total green cover. Regional or national guidelines must specify a maximum width for the weed free strip .

7. Irrigation

Irrigation must be applied according to need. Excessive soil moisture may result in leaching of nutrients. Excessive use of irrigation water is wasteful. In vineyards where irrigation is required, daily rainfall must be measured and the soil moisture deficit estimated. Irrigation water of adequate quality (conductivity, Cl-content) must be supplied according to the soil moisture deficit and the water storing capacity of the soil. Regional guidelines have to define the maximum water volume not to be surpassed.

Irrigation of vines for wine production will not be applied after véraison (BBCH-Scale 81-85) or highly restricted by the regional guidelines in order to guarantee the good quality of the wine.

8. 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).

9. Integrated Plant Protection

The modern approach to Integrated Plant Protection in the context of sustainable production systems has been described in Technical Guideline II.

Basically, all available prophylactic measures (= indirect plant protection) must be applied before direct control measures are used. The decision for the application of direct control methods is based on economic thresholds (tolerance levels), risk assessment and the services provided by the official forecasting services (prognoses).

Each IP-organisation working according to IOBC standards must establish a restrictive list of the key pests and diseases that require regular attention.

Indirect plant protection measures (= prevention) must be listed in the guidelines and the growers stimulated to use them to the fullest extent (e.g. resistant clones and cultivars, appropriate choice of planting and training systems when planning new plantations; avoidance of excessive nitrogen, proper canopy management to reduce disease and pest impact, green cover to replace herbicides and to enhance biodiversity within the vineyard at the botanical and faunistic level; the protection and augmentation of natural enemies).

At least two key natural enemies (one of them usually a Phytoseiid mite, the second one representing important insect parasitoids or predators) must be identified in regional guidelines and their protection and augmentation be declared important. Where Phytoseiid predators are absent from vineyards, they must be introduced where the pest situation (e.g. spider mites, thrips) requires regular control measures.

Risk assessment and monitoring

Populations of pests and diseases must be regularly monitored and recorded. Scientifically established assessment methods appropriate to the region or locality must be used. For each pest or disease the approximate level of infestation or the risk of damage must be estimated. The decision, if a treatment is necessary, must be based on scientifically established threshold levels and the official forecasts of pest and/or disease occurrence and risks. Existing and validated forecasting models for diseases should be used and the use of adequate monitoring devices by groups of growers recommended.

Direct plant protection measures (= control): 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 minimised. Plant protection products may only be used when justified. The most selective, least toxic, least persistent product or control procedure, which is as safe as possible to humans and the environment, must be selected.

National and regional IP-guidelines have to establish a selective list of officially registered products and procedures meeting these criteria. They have to be divided clearly into those that can be used without restrictions in the IP program ("green list") and into those products that can only be used with clearly defined restrictions ("yellow list") (see below).

Selection of pesticides

Where the use of plant protection products is necessary, the product selected must be the least hazardous to humans, livestock and the environment whilst providing effective control of the pest, disease or weed problem.

The following criteria should be taken into account in the classification of pesticides into 'permitted', 'permitted with restrictions' and 'not permitted' categories:

- Toxicity to man;
- Toxicity to key natural enemies;
- Toxicity to other natural organisms;
- Pollution of ground and surface water;
- Ability to stimulate pests;
- Selectivity;
- Persistence;
- Incomplete information on the pesticide.

Based on these criteria the following categorisation of certain pesticides and pesticide groups is established that might require sporadic up-dating with the development of new products:

Not Permitted

- Pyrethroid insecticides and pyrethroid acaricides;
- Organochlorine insecticides and acaricides if safer alternatives exist;
- All acaricides toxic to Phytoseiid mites;
- Toxic, water polluting or very persistent herbicides (e.g. Diquat, Paraquat).

Permitted with Restrictions

The IP-organisation applying for IOBC endorsement must prove that either no ecologically safer alternatives are available or that the active ingredient is necessary for a planned resistance management. Guidelines must define clearly the restrictions and permitted indications.

Examples:

- Broad-spectrum organo-phosphate and carbamate insecticides: precise indication and maximum number of applications;
- Acaricides moderately harmful to Phytoseiid mites: precise indication;
- Dithiocarbamate fungicides (maximum of 3 applications per season and not in succession, so that predatory Phytsoeiid mites are not affected);
- Sulphur (use must be limited so that predatory Phytoseiid mites are not affected);
- Fungicides with high potential to develop resistance (maximum number of 3-4 applications to be clearly defined);
- Copper (guidelines have to define the maximum amount in kg per ha and year);
- Residual herbicides with $dt90 < 1$ vegetation period: the situations of their exceptional use must be clearly specified;

Statutory maximum residue levels must be observed. The occurrence of pesticide residues on grapes at harvest - especially table grapes - must be further minimised by maximising safe-to-harvest intervals.

10. Efficient and Safe Spray Application Methods

Spraying equipment and spraying conditions minimising the health risk of the operator and drift should be preferred. Spraying in windy conditions is not permitted.

Sprayers must be calibrated at the beginning of each season and their proper functioning should be checked before each treatment.

The spray impact on the environment can be minimised by the proper calculation of the amount of product needed per ha depending on the phenological stage of the vine. For the establishment of rules concerning the appropriate amount of product to be used it is recommended to calculate the leaf surface of the fully developed canopy of a given planting and training system.

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

When new sprayers are purchased, transverse flow designs or tunnel sprayers should be selected where possible.

11. Inspection Procedures and Guideline Structures

Regional IP-organisations applying for endorsement by the IOBC Commission "IP-Guidelines and Endorsement" have to organise and operate their inspection and certification system according to the standards defined by Appendix 2 of the Technical IOBC Guideline I (2nd edition 1999).

With respect to the establishment of flexible national and regional guidelines we refer to the respective recommendation in Appendix 1 of Technical Guideline I (2nd edition 1999).

Selected Literature

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