

# Guidelines for Integrated Pome Cultivation 2019

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## **GUIDELINES FOR INTEGRATED POME CULTIVATION**



These guidelines consist of technical recommendations on the one hand and on the other, of mandatory obligations which must be fulfilled in order to obtain certification. For clear identification, the latter are printed in **red type** and are additionally emphasized by a **red exclamation point**.



AGRIOS suggests various ecological care measures for the producers in the individual chapters. These are printed in **blue type** and are marked by a **blue exclamation point**.

### **What is Integrated Production and what is its goal?**

By “integrated production”, we mean an agricultural production system for foodstuffs by which natural resources are conserved and aids such as fertilizer and plant protection substances are used prudently. It is a sustainable way of cultivation in harmony with nature that puts protection of human health and the environment at the forefront. The use of synthetic chemical measures is reduced to a minimum and fertilization is rationalized. Natural methods of maintenance are preferred, because of their positive effects on the orchard and the environment. It is the utmost concern of every producer who chooses integrated fruit production to implement as many of these ecological measures as possible.



At least two of the items chosen from this list must be realized in each year of cultivation. The points effected must be recorded in the orchards register.

## **INTEGRATED PRODUCTION IN CULTIVATION**

### **Technically schooled, environmentally conscious producers**

Good **technical training** and a **positive attitude** towards environmental protection and protection of the consumer are important conditions for integrated cultivation. To achieve this, AGRIOS uses lectures and newsletter to make the program understandable to its participants and to keep them informed about the continuation of developments in integrated fruit production.

Further, for the realization of a serious IP program a practice-oriented **research institute** and an efficient **advisory board** are indispensable. Also, the persons responsible for fruit marketing must show understanding and interest for integrated production and support the program in their area of responsibility. Producers must be professionally competent (agricultural-technical education or at least five years of work experience).



In addition, they must prove that all of the production areas cultivated according to the guidelines for integrated fruit cultivation are registered with an advisory organization. If they are members of a production organization, the organization must, as per EU market regulations, have a convention for professional advice through this advisory organization.

Each orchardist must attend at least two hours per hectare of job-related further education courses concerning the topic of integrated cultivation. Orchardists who cultivate more than ten hectares must attend at least 20 hours of further education. The reference value used for the examination is the larger of either net area or the area on the LAFIS document. The participation in further education courses must be listed and included in the orchard register. Since professional training is a prerequisite for obtaining certification, the above-mentioned minimum of training hours must be completed before the orchard register is checked before harvest.

## Ecological compensations areas and care of the orchard environment

The orchardist should also protect and care for the environment surrounding his orchard in accordance with integrated cultivation. Bushes, dry walls, rock piles or embankments serve as shelter for many beneficial animals and must not be sprayed with pesticides and herbicides or burned.

The ecological compensation areas must be at least 5% of the total fruit production area.



Ecological measures:

- Pond with a minimum area of 50 m<sup>2</sup>
- Standard-sized tree

## Considerations upon the creation of new orchards

**When planting new orchards**, the orchardist should choose for each location the fruit cultivar which because of its natural qualities offers the best chance for regular crops and good quality.



Ecological measure: Choice of a fungus-resistant cultivar.

It is important to choose planting material that is healthy and virus-free as well as true breeding (selected material). To prevent the occurrence of Fireblight, plant material accompanied by ZP b2-Plant Passport should be used where available.



**New plantings must consist of certified planting material when available. If such material is not available, CAC material must be used.**

**When new orchards are planted, the EU health certificates for all plant material used must be filed in the orchard register.**

**If self-made planting material is used, the legal minimum standards must be met and the origin of the original material must be documented.**

**The use of seed stock deriving from genetically modified organisms is not allowed.**

In new orchards, planting systems which allow the lowest possible use of herbicides and an efficient distribution of plant protection products are preferred.

The **planting distance** should be measured in a way that the chosen combination of variety and rootstock has enough room to grow without using severe pruning or synthetic plant growth regulators.

Tree height and depth should allow enough light penetration for fruit growing in the center of the tree.



Ecological measure: Planting a new orchard as a single row system.

This system of planting guarantees good light for the fruit during the entire growing season. Single rows require less use of plant protection products (especially reduce herbicides) than multiple row systems and allow alternatives to chemical strip treatments.

Soil preparation before planting must be effected in a way that conserves and, if possible, improves the fertility of the soil and prevents erosion and soil dissipation. Type of soil, location, risk of erosion and climatic conditions must all be taken into consideration. Additionally, soil cultivation shall contribute to preserving and promoting the soil structure and diversity of soil organisms as well as avoiding soil compaction and waterlogging.

Should preliminary or long-term fertilization be necessary, the specifications in the chapter about fertilization must be considered.



**Chemical soil decontamination is not allowed in integrated production.**

## Fertilization

The goal of fertilization in integrated production is to cover the nutrient requirements through natural cycles. Soil analysis is the most important basis for the fertilizer dosage of **phosphate, potassium, magnesium, boron** and other nutrients.



### Sampling: intervals and times

For every registered orchard (except from the land register) is required a soil analysis. A soil analysis certificate is valid for **exactly 5 years from the date of issue**.

**Exceptions:** Orchards made up of various parcels which demonstrate provable similar soil composition and supply rates and are cultivated similarly need only supply a soil sample from a representative area. This is only true if these areas belong to the same producer. If the parcels are different in soil composition (structure) and in nutritional content, a correspondingly greater number of soil analyses per orchard is necessary. Mixing of soil samples from various parcels is not agronomically wise. This makes a proposition for targeted fertilization impossible.

Following fertilization or soil working, an adequate period of time must elapse before soil samples are taken.

**Leaf and fruit analyses** are necessary to determine deficiencies or excesses of nutrients in the plant or to clarify problems with internal fruit quality.



Ecological measure: Execution of early leaf analyses.

Early leaf analysis made at the time the main growth period is ending gives a good picture of the nutritional condition of the tree. Imbalances in the tree's nutrition can be temporarily stabilized using leaf fertilization. Long-term fertilization must be made through the soil.

The **dosage of fertilizer** is determined by the nutrient levels in the soil and the needs of the plants. Soil and leaf analyses show especially well which type of fertilizer is needed for the specific site.

Overfertilization is to be avoided in the interest of maintaining the resistance of the fruit trees, the quality of the fruit, and the environment (ground water). The  $N_{min}$  test delivers clear indications of the amount of plant-usable nitrogen in the soil. The shoot length as well as the color and size of fruit and leaves can also be used in determining the nitrogen needs of the plant. Too much nitrogen makes the background color dark and foreground color is lacking, too much potassium increases the danger of bitter pit.



Ecological measure: Execution of nitrogen fertilization after N-min tests.

The N-min test determines the existing share of mineral nitrogen (nitrate and ammonium) in the soil. On the basis of humus content and soil type, the nitrogen replacement value of the tree row is estimated and finally, using these two values, the nitrogen fertilization is calculated.



The application of fertilizer is forbidden from 1 December to the end of February, also the application on frozen, snow-covered, waterlogged or flooded soil. A minimum distance of 5m is necessary near natural watercourses and artificial drainage ditches; a distance of 10m is necessary from natural lakes.

Farm manure (stable manure or slurry) must not come into direct contact with products destined for human consumption, therefore its application is allowed only post-harvest until 30 November and from 1 March until the end of blossoming.

Farm manure can be applied up to a yearly average of 85 kg of nitrogen per hectare.

### Nutrient removal (guideline values)

The following table contains the annual extraction of principal nutrients (kg/ha) in apple production by various yields:

Nutrient	Removal of principal nutrients (kg/ha) with a crop yield of		
	40 t/ha	60 t/ha	80 t/ha
Nitrogen (N)	16	24	32
Phosphorus (P <sub>2</sub> O <sub>5</sub> )	11	16	21
Potassium (K <sub>2</sub> O)	57	85	113

Calcium (CaO)	3,2	4,8	6,5
Magnesium (MgO)	3,4	5,1	6,8
Boron (B)	0,112	0,18	0,24

Source: Laimburg Research Centre



Fertilizer dosage is measured according to the following parameters:

#### Nitrogen fertilization

Addition of nitrogen	1 <sup>st</sup> year	2 <sup>nd</sup> year	> 2 <sup>nd</sup> year Crop yield (t/ha)		
			< 32	32-48	> 48
Nitrogen kg/ha	40	80	50	80	110
If soil conditioners are used in the current year, nitrogen is calculated at 30%.*					

\* For soil improvers (stable manure, compost), it is important to take the mineralization process that the organic mass is subject to into consideration. For example, stable manure applied as a long-term soil improver in a multiyear cycle: at a nutrient level of 170 kg N, 102 kg P<sub>2</sub>O<sub>5</sub> and 238 kg K<sub>2</sub>O per hectare, about 30% of this amount or 51 kg N, 31 kg P<sub>2</sub>O<sub>5</sub> and 71 kg K<sub>2</sub>O is available.

#### Amount of nitrogen which can be added to the standard dose depending on the corresponding conditions:

• By low supply of organic matter	+ 20 kg/ha
• By low growth	+ 20 kg/ha
• By surplus of precipitation	+ 15 kg/ha

#### Amount of nitrogen which must be subtracted from the standard dose depending on the corresponding conditions:

• By high supply of organic matter	- 20 kg/ha
• By addition of organic fertilizers in the previous year	- 20 kg/ha
• By excessive growth	- 20 kg/ha

In any case, the maximum addition of nitrogen allowed lies at 140 kg/ha/year.

To keep losses due to washout to a minimum and to attain the largest possible effectiveness of fertilization, it is necessary to apply the nitrogen during the phase of greatest demand, and, in the case of larger amounts, to distribute the amount over several applications. If the amount needed is more than 60 kg/ha, it must be allocated in multiple applications.

#### Phosphorus fertilization

Supply of phosphorus	1 <sup>st</sup> year	2 <sup>nd</sup> year	> 2 <sup>nd</sup> year Crop yield (t/ha)		
			<32 t/ha	32-48 t/ha	>48 t/ha
<b>A+B</b> (low supply)	15	40	45	55	65
<b>C</b> (normal supply)			30	40	50
<b>D+E</b> (high supply)			25	35	45

**Amount of P<sub>2</sub>O<sub>5</sub> which can be added to the standard dose:**

• By low supply of organic matter	+ 10 kg/ha
• By soil with high lime content	+ 20 kg/ha

**Before planting and during the vegetative period:**

- For classes A+B without preliminary fertilization before planting max. 65 kg/ha/year for 5 successive years.
- In any case, even when supplementary or preliminary fertilization is implemented, is it not allowed to exceed 250 kg/ha P<sub>2</sub>O<sub>5</sub> per year.

The annual amounts necessary can also be accumulated and applied every second or third year.

**Potassium fertilization**

Supply of potassium	1 <sup>st</sup> year	2 <sup>nd</sup> year	> 2 <sup>nd</sup> year Crop yield (t/ha)		
			< 32 t/ha	32-48 t/ha	>48 t/ha
<b>A+B</b> (low supply)	20	90	115	150	185
<b>C</b> (normal supply)			55	90	125
<b>D+E</b> (high supply)			15	50	85

**Amount of K<sub>2</sub>O which must be subtracted from the standard dose:**

• By addition of organic fertilizer	- 30 kg/ha
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**Before planting and during the training phase:**

- For classes A+B without preliminary fertilization before planting max. 180 kg/ha/year for 5 successive years.
- In any case, even when supplementary or preliminary fertilization is implemented, is it not allowed to exceed 300 kg/ha K<sub>2</sub>O per year.

**Magnesium and boron**

Nutrient requirements in kg/ha by a crop yield of 60 t/ha, determined on the basis of soil analysis.

Supply class	MgO	Boron
<b>A+B</b> (low supply)	30-50	0,7-1,4
<b>C</b> (normal supply)	20-30	0,5-0,7
<b>D+E</b> (high supply)	0-20	0-0,5



The actual amount of fertilizer applied is to be recorded in the orchard register.

Routine spraying with leaf fertilizer do not bring economic advantages in well-supplied orchards and are as such to be avoided. An oversupply through the leaves can cause problems in fruit quality.



The following fertilizers may not be used in integrated production:

- Fertilizers not corresponding to either EU fertilizer regulation (Nr. 2003/2003) or national fertilizer regulation (Decretolegislativo del 29 aprile 2010, n. 75).

- Fertilizers containing raw material from certain animal by-products: meat meal, meat residues, fishmeal, bone meal, blood meal, blood, gelatine, animal dander, skins or leather.
- Fertilizers containing more than 0,001g/kg of perchlorate.
- Leaf and fertigation fertilizers which exceed the following legal limits for aminoalcohols:
  - Morpholine 0.01 g/kg
  - Diethanolamine 0.01 g/kg
  - Triethanolamine 0.01 g/kg
  - Monoethanolamine 0.1 g/kg.
- Fertilizers with a boron content of more than 0.1% that contain sodium borate or boric oxide. The fertilizers listed in the appendix may be used in integrated production. The updated list is published on the AGRIOS website.

Sludge and compost as well as fertilisers which contain toxic or soil-contaminating components or which bring up hygienic reservations are not allowed in integrated cultivation.

All equipment used to apply fertilizer must be appropriate for the respective purpose and be kept in good condition. This includes regular maintenance as well as annual inspection and calibration to insure that the desired quantities of fertilizer are in fact applied. This maintenance must be recorded in the maintenance plan added to the orchard register.

## Plant fortifiers

The plant fortifiers listed in Appendix 2 of the Ministerial Decree No. 6793 from 18.07.2018 can be used.

## Care of the lanes and rows

In orchards with vigorous growth, the rows should be left **green throughout the year** and mulched along with the lanes or the area around the trees should be mowed.

A mulch cover before harvest reduces the nitrogen supply and promotes fruit quality as well as reducing the nitrate reserves at the end of the vegetation period.

A mulch cover of low and flat-rooted plants in the rows (that is, competing with the trees neither over nor under the ground) is to be considered ideal.

**Covering** the area under the trees with tree bark keeps the ground damp, suppresses grass growth and reduces erosion, and is thus to be considered favorable. This measure can however favor the settlement and reproduction of field mice.

Mechanical treatment of the rows is also an environmentally-friendly solution.

In **areas of vigorous growth**, no herbicides should be used.



Ecological measure: Keeping green the tree strip the whole season or keeping the tree strip free of grass using alternative methods without herbicides.

As far as the tree growth and the natural nitrogen delivery allow, the lanes and tree strips should be kept green all year. This leads to bonding of nitrogen, which is useful especially in orchards with vigorous growth.



In **single row orchards**, the **area treated with herbicides** must not be more than 70 cm wide, may however be up to a maximum of one-third of the planting distance between rows.

In **multiple row orchards**, treatment is only allowed on the area covered by trees. The maximum width of the herbicide treatment strip in multiple rows is the area between the rows plus 35 cm to each side of the outside rows, measured from the tree trunk.

Since 26.11.2018, all herbicide devices are subject by law to a functional test. In order to reduce drift to unintended areas, AGRIOS recommends the sole use of herbicide devices with covers and retrofitting of lacking coverings.

Where orchards in the zone infested by May bugs are covered by ground nets, a universal spraying of herbicides is allowed.

The frequency of mulching for **care of the lanes** should depend on the characteristics of the orchard (tree growth, soil type, water balance). By vigorous tree growth and wet weather, 3-4 rounds a year should suffice. Less frequent mulching allows for more variety of ground cover plants.



When products dangerous to bees are used, blooming ground cover must be mowed first.

## Irrigation

Irrigation is meant to cover the water requirements of the crop. It ensures sufficient growth of the plant and fruit and their quality development. Avoid both over and under watering.

Excessive watering causes water and nutrient loss and can promote the development of harmful organisms. In late summer, it can lead to inadequate lignification, increasing the danger of frost damage in sensitive varieties.

Through excessive sprinkler use in summer, scab and Alternaria infection can be promoted because of perseverant leaf wetness and rinsing off plant protection substances.

The application of irrigation should correspond to the actual requirements



Ecological measure: testing of soil moisture using a tensiometer or other device for measuring soil moisture.

The amount of water should depend upon the deficiency of precipitation as well as on the acqueosity (field capacity) and the profundity of the ground.

If technically possible, the use of fertigation is recommended in order to increase the effectiveness of the fertilizer and to reduce washout.



For every orchard in production, the following data must be recorded in the orchard register:

### 1) Irrigation date and amount:

- Overhead sprinklers - date and amount of each individual irrigation; the amount of water is determined as follows:
  - by reading the rain gauge,
  - by reading the gauge on the water supply lines of the individual properties,
  - by calculation of the amount of water applied per hour
- Drip irrigation: irrigation amount for the total culture cycle (or shorter period), citing beginning and end of irrigation.

If irrigation is realized collectively or through consortiums, the above mentioned data can be supplied through those organizations.

**2) Precipitation data:** readable through rain gauges or weather stations or through data supplied by weather services. (Production operations with a cultivation area of less than a hectare and areas with drip irrigation are exempt from the recording of these data.)

### 3) Irrigation amounts:

By each implementation of irrigation, the producer must not exceed the following maximum amounts, depending on the soil type:

Soil type	Millimeter	m <sup>3</sup> /ha
Light soil	35	350
Medium soil	45	450
Heavy soil	55	550

Frost irrigation is exempt from the above mentioned regulations.



All possibilities for efficient use of water resources should be exhausted; for example: night irrigation, repair of leaks, reduction of the water amount per irrigation period, etc. Where possible, drip irrigation should be preferred.



Ecological measure: Use of drip irrigation

#### **Water quality:**

The resources available for the irrigation of fruit cultivation have been regularly controlled since 1997 through a monitoring program of the department of water use of the Autonomous Province of Bozen-Südtirol. These examinations provide information about the quality of the water. Upon request, the corresponding documents can be made available by the department.



**Sewage water must never be used for irrigation.**

### **Tree training and fruit quality**

**Yearly growth** of 20-40 cm is desirable. In the case of more vigorous growth, appropriate measures (adjustment of winter pruning, reduction of nitrogen fertilization, reduction of irrigation, root pruning and ground cover propagation under the trees) can inhibit growth.

Regular, good-quality crops are indispensable for economic success in commercial orchardry. That is why the orchardist should always try to better fruit quality (fruit size, color, taste, internal quality, shelf life and hygiene) by the use of environmentally friendly measures. Many varieties require chemical fruit thinning (allowed products - see appendix). Thinning surplus, small, deformed or otherwise damaged fruit by hand is an especially good method of improving fruit quality.



**For reduction of russet, only kaolin as well as gibberellins and Benziladenin are allowed. Synthetic products which speed up or slow down ripening or improve the color are not allowed for this purpose.**



Ecological measure: thinning using a mechanical blossom thinner.

### **Integrated crop protection**

#### **a) Prevention**

The entire cultivation program should be aimed at maintaining the trees' natural **resistance** against diseases and pests so that no additional spraying is necessary. Trees with too vigorous growth, for example, are especially susceptible to scab, mildew, aphids, mites and tortrix moths.

Integrated crop protection means further protecting and promoting **natural enemies** of pests. In the interest of **natural protection of species** and to promote the settlement and reproduction of beneficial animals in the orchards, we recommend the following measures:

- At the edges of the orchards, **hedges and bushes** should be left as shelter and breeding places for many species.
- Dry walls are welcome **shelter** for weasels, hedgehogs, shrews, various snakes and other beneficial animals. The same is true for rock piles, wood piles, and similar hiding places.
- To attract **birds of prey** (buzzards, falcons, owls, etc.), perches should be installed in the orchards above the trees. Birds of prey keep the orchard clean of mice.

- **Insectivorous birds** (titmice, wrynecks, tree sparrows, redstarts, hoopoes, etc.) collect many larvae (winter moths, clouded drab moths, clear wing borers, and tortrix moths), especially during nesting. We recommend hanging nesting boxes (entry hole 32, 45 or 55 mm) in the orchard.
- **Predatory mites**, if properly protected, keep spider mites under control in the orchard with the help of spider beetles and minute pirate bugs. If there are not enough predatory mites in the orchard, these should be carried in on bundles of branches from other orchards.
- Pots or boxes filled with straw or wood-wool can be hung up in the orchard as winter quarters for **lacewings** (Chrysoperla).



Ecological measures:

- Setting up of nesting boxes in the orchard to attract titmice.
- Construction of perches for raptors
- Creation of hiding places for weasels, hedgehogs, shrews or grass snakes.
- Introduction of predatory mites into the orchard.

### **b) Alternative plant protection measures**

In integrated production, **alternative** (non-chemical) **products and measures** are to be given preference.

- **Shoots infested with mildew or aphids should be cut off.** Thus the intensity of infestation can be reduced and the success of abatement can be improved.
- **Mating disruption** should be used where codling moths, oriental fruit moths, tortrix moth and leopard moth are present. At low infestation rates, reduction of the population is achieved, and prevents the problems that an increase in the population involves. This biotechnical method makes it possible to avoid or reduce spray applications thus avoiding or at least delaying resistance. The dispensers used should be, if possible, biodegradable.
- **Alcohol traps** (8 per ha) are the most effective methods of fighting the European shot-hole borer (Anisandrus).
- **Juice traps** are suitable to fight clear wing borers. Only young clear wing moth larvae can be satisfactorily controlled using insecticides. Besides that, this method of control is technically hardly feasible for older trees. A large part of the moths can be caught using juice traps
- **Mass reproduction and release of beneficial insects** (San José parasitic wasps, woolly apple aphids Trichogramma, parasitic mites, etc.), is more effective over a long period of time than chemical controls.
- Trees with clear symptoms of apple proliferation must be stubbed without delay.



Ecological measures:

- Use of mating disruption against codling moth, oriental fruit moth, tortrix moth and leopard moth.
- Use of juice traps to fight clear wing borers
- Removal of shoots infected with mildew or aphids.
- Use of ground nets in orchards subject to May bug infestation.

### **c) Resistance management**

Resistance of harmful organisms can make plant protection very difficult and lead to serious problems in regulating harmful populations. All possible precautions should be taken to prevent eventual building up of resistance. The goal of integrated production is to use all non-chemical possibilities and to include or

integrate them. IP is through consequential adhesion to its principles suited from the very start to prevent and/or delay resistance of harmful organisms.

The most important principles of a program aimed at resistance management are briefly described below:

- **Reduction of crop protection products use:** Each action that can be avoided delays resistance. If a treatment becomes necessary, the active ingredients should be chosen and used with care. This requires a good knowledge of biology and of the occurrence of the harmful organism. The choice of the correct product and time of use, the right dosage and well-aimed application lead to optimal results and usually avoid the necessity of follow-up treatments. Insecticide application should be limited to the area of infestation.
- **Avoidance of a permanent spray layer:** Effective layers of spray should remain on the tree and in the environment only as long as absolutely necessary. Even short-lived active ingredients which are used repeatedly within short intervals result in a permanent spray coating. Long-lived, persistent active ingredients should be used sparingly and suited to the period of damage. For this reason, the use of several substances is limited.
- **Use of alternatives:** This is a basic requirement of integrated plant protection. Included in these methods are for example pheromone traps, *Bacillus thuringiensis*, May bug nets, natural enemies (predatory mites) etc.
- **Protection and promotion of beneficial organisms:** Beneficial organisms occupy an important place in resistance management. Their regulatory effect on harmful organisms helps to avoid treatment. Independent from degree and mechanism of resistance of the pests, beneficial organisms destroy them and counteract the selection of a resistant population.
- **Substitution of active ingredients:** A well-considered change of active ingredients used can delay development of resistance over a long-term period. Decisive is, however, that the actual method of effect, that is, the killing mechanism, is changed. The active ingredients used should therefore belong to different groups. As far as possible, the program offers choices.

**Resistance management must begin as long as the products are still working.** According to present knowledge, some active ingredients are because of their characteristics especially prone to building up resistance. The use of these is therefore to be limited (see the active ingredient list in the appendix).

Acaricides should not be necessary in an integrated program because of consequential protection of predatory mites. Limited use of these products can preserve the full effect of them for those cases where, because of several reasons, acaricide treatment is required.

**Well-considered and consequential resistance management** is in accordance with integrated production and is the prerequisite for its long-term success.

#### **d) Choice of products**

The **goal of integrated plant protection** is to guarantee the economical success of the orchard using as little and as environmentally-friendly plant protection products as possible.

Chemical measures should only be implemented in integrated plant protection when necessary.



The orchards must thus be checked for disease, pests and beneficial organisms at the most important observation dates Per year, at least two analyses of at least four hours per hectare for beneficial organisms must be performed. At the end of May or beginning of June, the level of primary scab infection must be determined in the orchard (100 shoots per orchard). Per hectare of registered area, annual field checks of at least 8 hours must be made. The reference value used for the examination is the larger of either net area or the area on the LAFIS document. The checks and the results of the counts must be recorded in the orchard register. The reference value used for the examination is the larger of either net area or the area on the LAFIS document.

Out of the list of legally allowed plant protection products, those which:

- do not endanger the **user** or the **personnel working in the orchard**,
- reduce the pest population under the **threshold of tolerance**, yet protect beneficial organisms and other animals,
- do not unnecessarily pollute the **environment** (soil, water, air), and
- leave few **residues** on fruit and in the environment should be preferred.

Plant protection measures with a low level of health risk for the user are preferable if there are formulas with the same active ingredient that carry especially critical hazard codes.



Products harmful to **predatory mites** should also be avoided. A maximum of 5 applications with dithiocarbamates per year is allowed. Further, the intervals between spraying with these products must be kept longer, and they must be used alternately with other fungicides.

Where spraying against spider mites is necessary, the biological balance between this pest and its natural enemies is disturbed. In this case, the use of dithiocarbamates and other products harmful to beneficial insects must be limited, above all in order to guarantee the protection and promotion of predatory mites and other enemies of spider mites (spider beetles, minute pirate bugs, etc.).

In orchards where selected pesticides are used, beneficial insects can live and thrive.



In the AGRIOS program 2019, only those substances are allowed (with corresponding limitations) which are listed in the national guidelines 2018-2019 and in the substance list for integrated pome fruit cultivation 2019. Any and all **active ingredients not listed there are not allowed in the AGRIOS program 2019** unless authorized during the year. Use of an active ingredient not allowed in the program or the proof of its use through residue analysis leads to non-issuance or the withdrawal of certification for the respective orchard sector or the entire orchard. The non-issuance or the withdrawal of certification for the orchard sector in question is also effected when plant protection products are used which are not allowed in Italy for the individual plant culture.

#### **Active ingredients for use in organic production**

In integrated production, all active ingredients which appear in Appendix II of the ordinance (EC) Nr. 889/2008 for organic production and are authorised for use in Italy may be used.

#### **Using up leftover plant protection substances**

Leftovers of plant protection substances which were still allowed in the previous year's IP program may be used up. This exception to the rule is only valid for the amounts of plant protection substances which were already present in storage and registered in the inventory lists. The regulation is not valid for those plant protection substances which are no longer allowed.

#### **Limitations on label**

The instructions for use on the labels of plant protection substances must always be followed.

#### **Pollinator varieties**

If an orchard contains single trees as pollinators which are treated during plant protection measures together with the main variety, the same restrictions for the main variety are also valid for these.



Ecological measures: Placement of pheromone traps and regularly control of the moth catches. Pheromone traps offer the possibility of observing the flight course of important pests (i.e. apple codling moth, oriental fruit moth, tortrix moth). Correct interpretation of all data (peak and length of flight, weather, laying of eggs) can help in making a decision. As different traps have varying ability to catch insects, the orchardist should turn to an expert in case of difficulty in interpretation.

#### **e) Plant protection product use per ha and year**

The amount of plant protection products used in an orchard per ha and year is determined by 3 factors:

- **Dosage:** In principle, the lowest possible dosage needed to push the pest population under the threshold for tolerance should be used when applying products. 100-percent extermination of a pest is not in accordance with integrated plant protection. It is relatively expensive, promotes the development of resistant species and damages the environment more than is necessary.
- The **amount of spray** per ha depends on planting system, tree height and spray concentration. Using normal concentrations, it should not exceed 500 liters/ha/meter of tree height in a single row system. When using a fine spray system with high concentration, the spray amount should be reduced accordingly.
- The number of applications per year must be justified by the pest population (threshold of tolerance), the weather conditions (for example with scab) as well as by the estimated crop loss (economical threshold of damage). Tips as to thresholds for intervention concerning various pests are given in the guideline brochure „Leitfaden zum integrierten Pflanzenschutz“ of the South Tyrolean Advisory Service for fruit and wine growing.



Chemical control of where codling moths, oriental fruit moths and tortrix moths may only be implemented upon reaching the infestation threshold in the appendix. The exceedance of the damage threshold must be documented by corresponding counts registered in the orchard register.

## Storage and application of plant protection products

### Proper storage, application and elimination of plant protection products



Plant protection storage may consist of a separate room, a separate area divided by a metal grate or fence or a plant protection cabinet. Entrance or access to the storage area is restricted to trained users of plant protection substances. Appropriate danger signs with emergency numbers must be exhibited on the outside of the space or cabinet. The door to the storage area must have a safety latch, and access must not be possible through other openings (e.g. windows). The storage area must be under constant supervision when open. The storage area must be made in a way that allows any spilled or leaking plant protection substances to be collected without any danger of environmental contamination. This collection system must ensure that no plant protection substances, cleaning water or waste from plant protection substance are released into the environment, water, or sewer system. In the storage area, sufficient air exchange must be guaranteed. To prevent entry by animals, the air vents must be equipped with grates. The storage area must be kept dry and protected from precipitation and sunlight. The plant protection substances must not be subjected to extreme temperature influence. The shelves must be made of nonabsorbent material and may not have any sharp edges. Wooden shelves can be sealed with water-repellent protective paint.

All plant protection substances (including herbicides) must be stored in their original packaging with intact and legible labels. Solid formulas must always be stored above liquid plant protection substances. Fertilizers, such as foliar fertilizers which are applied in conjunction with plant protection substances, can be stored in the plant protection storage area. Soil fertilizers, however, must be stored separately from plant protection substances.

Plant protection substance waste such as empty packaging, expired or no longer usable products may also be stored there temporarily. They must be kept separate from the plant protection products in a correspondingly labeled area. Scales and measuring cylinders must be kept in stock. After use, they must be washed and stored in the storage area.

No food or feed may be kept in the plant protection storage area.

Before the plant protection season starts, a list must be made of the plant protection substances on hand and added to the orchard register.

During the preparation of the spray, appropriate protective clothing must be worn.

If the spray solution has been correctly calculated and the sprayer correctly calibrated, there should be no solution left over. In the case that some solution remains, it must be thinned with the rinse water and sprayed in the previously sprayed orchard.

The orchardist is required to dispose of empty spray packaging and obsolete crop protection products according to the existing provincial measures.

### **Spray application methods**

Before the first use of a new sprayer, its spray plume should be calibrated to suit the orchard (planting system, tree height). Environmentally safe spraying methods are indispensable for integrated cultivation. Sprayers with transverse flow sprayers and those with methods of collecting drifting spray and recycling it (tunnel sprayers) cause the least amount of spray drift into the environment.

To prevent unnecessary spray drift onto the ground and into the air, all jets of the sprayer must aim directly at the leaves of the trees. Jets which spray under or above the leaves must in any case be shut down before spraying.



To prevent spray drift to nearby areas, exact adjustment of the air volume and speed of the sprayer relative to the characteristics of the orchard is necessary. These adjustments must be made once a year after blossoming of the orchards. The adjustment measures implemented must be recorded and filed along with the orchard register.

The use of injector flat jet nozzles significantly reduces drift.



Spraying equipment must be kept in good condition and annually serviced and calibrated to insure exact application of the desired quantity of spraying solution. The maintenance work performed on the spraying equipment (adjustments, repairs, replacement of parts) must be recorded in the appropriate maintenance plan added to the orchard register.

All orchardists are required to have their sprayers checked at a recognized test stand at least every 5 years. In order to take part in the AGRIOS program, a sprayer with drift-reducing technology with at least the following equipment must be used:

- Blower attachment;
- Every set of nozzles must be equipped with air suctioning injector flat jet nozzles with a spray angle of 80° - 90° **on at least the three uppermost jet positions;**
- An automatic back-flushing filter system where one set of filters must have a mesh size of at least 80 mesh.

This equipment must be documented by the corresponding certificate with predetermined content and, if necessary, accompanied by an additional declaration from the producer.

The spray device used must belong:

- To the producer himself,
- To the farm manager,
- To another producer whose area is managed by the same farm manager,
- To a close relative or in-law of the farm manager,
- Alternatively, to a third party (documented by invoice or contract and against payment, for example through leasing or a machinery ring).

If the use of a spray device is not possible for a comprehensible reason (for example, type of terrain), a hose line with a spray pistol may be used to apply plant protection substances.



Ecological measures: Use of spraying equipment with a blower attachment and injector flat jet nozzles on all nozzle positions.

### **Pre-harvest intervals**

The security intervals between the last spray application and harvest required in integrated production are listed in the appendix.

This safety margin ensures that the promised results relating to the maximum level of the legal limit reached can be fulfilled. Usually it deals with the legal waiting periods for the various substances.

The first harvestable date must be calculated with the following formula:

**Application date + AGRIOS-waiting period (in days) + 1 day = first harvestable date**



### **Residues of plant protection**

Eventual residues of plant protection substances on fruit produced using integrated production may not exceed 50% of the legal limit. If the analytical limit of determination has been determined as the highest allowable residue content, this value is also sufficient for AGRIOS goods.



### **Water protection**

While filling the spray equipment with water and preparing the spray mixture, it must be ensured that no part of the solution finds its way onto the ground or into bodies of water. During application of plant protection measures it is important to be sure that none of the spray solution reaches open water. Therefore, upon planting new orchards, an adequate distance from ditches and streams should be observed. In the use of certain plant protection substances, a minimum distance to watercourses must be kept and the corresponding label recommendations on the packaging must be followed.

### **Danger of spray drift**

Where apple varieties with different harvest dates border one another, attention must be paid to spray drift from the neighboring properties. Spray drift shortly before harvest can raise the amount of residues on the fruit.

To keep spray drift on early ripening varieties to a minimum, the last row should only be sprayed on the outer side towards the inside and the fan should be turned off in the last row from mid-June on.



**Spray drift into open waters or neighboring biotopes must absolutely be avoided.**



### **Measures for reduction of spray drift to feed, grain and herb cultivation areas**

Every producer who plants or replants trees immediately bordering on a feed, grain or herb cultivation area belonging to another owner must, in that year, attend an advanced training course about "Problems and possibilities of action in the cultivation of different crops in close proximity". The corresponding attendance certificate must be included in the orchard register and is valid for five years.

A planting distance of at least 3 meters must be adhered to (measured from the tree trunk to the property line) when the rows run parallel to the property line of the adjacent property including one of the above mentioned crops, and of at least 5 meters (measured from the tree trunk to the property line), when the tree rows run perpendicular to the property line. These minimum distances to other crops may not be reduced, even in the case of mutual consent of both property owners. These minimum distances provide the basis for good agricultural practice in connection with application of plant protection substances and the reduction of spray drift.

Along the property line running parallel to the tree rows, a barrier against spray drift (e.g. hedge, living fence with foliage during the apple vegetation season, finely woven mesh fabric) must be erected in a height corresponding at least to that of the crop treated.

Suitable native deciduous plants for the erection of hedges include hornbeam, common maple, *Viburnum opulus* or *lantana*, *Colutea*, privet, *Cornus sanguinea*, hazelnut, *Ostrya* or equivalent varieties.

Of the evergreen plants, the following are suitable: yew, false cypress, *Euonymus japonicus*, bamboo, arborvitae, Leyland cypress, common laurel, common juniper, *Elaeagnus x ebbingei*, garden privet, Portugal laurel, *Arbutus*, *Pittosporum* or equivalent varieties.

Climbing plants suitable for living fences include the following varieties: ivy, winter jasmine, common hops, *Parthenocissus*, *Solanum jasminoides*, clematis, honeysuckle or equivalent varieties.

An untreated end row of the same or another crop is not recognized as a spray drift reduction barrier.

For orchards immediately bordering on feed, grain or herb crops belonging to another owner, the use of spray equipment with a crossflow attachment and injector flat jet nozzles on all nozzle positions as well as a cover plate is required. The last tree row must be treated only from the outside of the row to the inside.





Ecological measures: Planting of a hedge in order to reduce the drift to neighboring property.

### **Measures for minimizing drift onto organically cultivated fruit production areas:**

We refer to the framework contract for conflict-free coexistence of organic and integrated fruit production areas.

### **Rodent control**



No substances are allowed at the moment for rodent control (mice). Should a substance be allowed in the course of this year, the following should be heeded in the case of application. To avoid endangering man, birds, pets or wild animals, application is only allowed using the appropriate containers provided. The baited area must be identified with the appropriate danger signs.

### **Bee conservation**

The Western honeybee (*Apis mellifera*) is one of the most important pollinating insects in fruit cultivation. Pollination of the blossoms takes place when the bee collects pollen and nectar as food from the blossoms. During collection, pollen sticks on the bee's coat and is transferred to the stigma of the next blossom it visits. Bee pollination not only ensures the agricultural crop and raises the level of fruit quality, but also guarantees biodiversity. This is why honeybees must be protected.

Treatment by plant protection measures can also pose a danger to the honeybee. If producers recognize the behavior pattern of the honeybee, there are possibilities of treatment by plant protection measures which significantly improve the protection of bees.

### **Safety precautions**



- The department of horticulture and viticulture annually defines a period of time (tranzumance) during which treatment using plant protection substances that are dangerous to bees is banned. This ban must be adhered to unconditionally.
- Outside of the tranzumance period, the spray of substances harmful to bees must not reached blooming plants. Special heed must be taken to protect early bloomers (for example, hazelnut or alder) which bees need in early spring for their offspring.
- Through proper use of the technology of low-loss spraying, drift onto blooming plants can be avoided.
- Outside of the tranzumance period, substances harmful to bees should be applied if possible in the evening hours, at night or in the early morning, when bees are no longer active. Once the spray has dried, the danger of harming bees is greatly reduced. If the spray solution has already dried, the danger of bee poisoning is significantly lessened. This must be kept in mind, especially in the period after apple blossoming. Foraging bees continue to fly through the orchards in this period, looking for food on the plants blooming in the undergrowth. This is especially important when they are unable to find attractive flowering plants outside the apple orchard. In most years, we have recorded a longer period between the end of apple blossoming and the beginning of blossoming in the woods. It is precisely during this time that the bees return to the orchards looking for pollen.
- Before using substances harmful to bees, the blooming undergrowth must be mulched. This process should also be performed when bees are not active, since many bees also visit the blooming undergrowth.
- During blossoming, substances harmful to bees should only be applied in times of bee inactivity. Furthermore, we recommend not mixing these substances during blossoming or if not otherwise possible, applying them only with a mixing partner.



Before plant protection substances are applied, it is important the producer and nearby beekeepers consult and determine certain rules of conduct. This can help avoid many problems before they occur.



Substances harmful to bees must not be used from the time from the opening of the first blossom until the last blossoms have faded. The dates for the beginning and end of blossoming recorded in the orchard register are binding. The use of plant protection substances harmful to bees after the beginning of blossoming or before the recorded end of blossoming will be penalized in the same way as their use during the period determined by the administration.

**Plant protection substances harmful to bees:**

Substances classified as harmful to bees are all those annually published by the department of horticulture and viticulture prior to blossoming. This decree must be respected. Below is a provisional list of those substances classified as harmful to bees.

Abamectine	Indoxacarb	Spirodiclofen
Chlorantraniliprol	Milbemectin	Spirotetramat
Chlorpyrifos-methyl	Phosmet	Sulfoxaflor
Emamectin benzoat	Pyridaben	Tebufenpyrad
Etofenprox	Spinetoram	Triflumuron
Flonicamid	Spinosad	

## FRUIT FROM IP IN THE PROCESSING AND/OR MARKETING ORGANIZATIONS

### Delivery to the processing and/or marketing organizations

The parameters for harvest and delivery of the fruit are determined by the respective marketing organizations and are directed at picking the fruit at the optimal point of ripeness so that they can be suitably stored. Lots of fruit from integrated cultivation must be clearly labeled as such (on the delivery order and on every bin) upon arrival in the storage facility.

In the storage facility, all lots from one producers are precisely recorded (Date of delivery, number of delivery order, variety, number of bins or boxes, net weight, orchard parcel and so on) through the storage records and by a particular variety code. In this way, a clear overview of all AGRIOS and non-AGRIOS lots in storage.

Upon delivery, a list of all registered producers, orchard parcels and varieties must be available from which the non-issuance or the withdrawal of certifications and the voluntary cancellations are discernable. In this way, unintentional storage of fruit whose cultivation does not conform to the guidelines as AGRIOS products can be avoided.

The controllers can at any moment take samples to have the fruit examined for eventual residues of chemicals or other foreign substances.

### Treatment and storage of the fruit in the storage facility

In the storage facility, various diseases can occur. The causes are partly of a physiological nature (scald, internal breakdown, bitter pit, lenticel spots and so on) and partly various fungi can infect the fruit and cause great losses.

#### a) Fungus diseases

Fungus diseases (storage scald, gloeosporium, monilia, penizillium, phytophthora and others) can usually be effectively fought in the orchard. Spring treatments are to be effected exactly and on time in order to prevent

primary infestation (scab). The final treatment in the orchard is very important and should coordinate the proper substance with the weather, location and variety. Late infections are in this way largely avoidable.

#### Tips for hygiene in storage:

- Use clean bins for harvest
- Avoid contamination of the bins by soil, as these represent sources of infection
- Cleaning of storage cells, grading lines and packaging lines



Post-harvest treatment with fungicides is not allowed.

#### b) Scald

In the susceptible varieties Granny Smith, Red Delicious, Stayman Winesap, Morgenduft, Pinova, Fuji and Cripps Pink, this physiological dysfunction can appear even after relatively short periods of storage. As a method of preventing scald in many apple varieties, the AGRIOS program allows treatments with 1-MCP (Methylcyclopropene).

### Grading and packaging

The handling of fruit from integrated cultivation in the storage facility must be executed in a way which excludes the possibility cultivation of mixing or confusing them with non-AGRIOS lots. Fruit from integrated cultivation must not be contaminated by foreign substances during emptying (water bath), calibration, grading or packaging.



During grading it must be clearly visible if IP products are being processed or not. This must also be controllable for longer periods of time; **in no case may AGRIOS lots be mixed with non AGRIOS lots.** Especially during grading and temporary storage **labeling of pregraded lots must be made in a way which cannot be changed afterwards.** Also packaging must be clearly recognizable and traceable as to whether the lot comes from AGRIOS producers or not.

Fruit from integrated cultivation must be packaged and supplied in hygienically harmless, foodstuff approved, **environmentally friendly packaging.**

### Labeling and presentation of the fruit from integrated production

South Tyrolean fruit which is proven to have been cultivated and stored according to the guidelines and has passed all test has the right to use the term “**from integrated production**”.

The orchardist, the persons responsible in his marketing organization and the certification body guarantee with this as far as possible through checks and analyses that the fruit has been cultivated and stored according to the guidelines.

All **liability** for the impeccable soundness of the fruit with regard to the consumer, the business partners and the department of health remains however with the marketing organization and orchardist.



South Tyrolean fruit which has not been **proven** to be cultivated according to the guidelines and is not recognized by the certification body may not use the term “from integrated production” or similar terms. If products from South Tyrol are used for trademarks requiring integrated production, these products must be proven to conform to the AGRIOS guidelines.

# APPLICATION OF INTEGRATED PRODUCTION

## Participation

Each producer and marketing organization wishing to take part in the AGRIOS program must submit a written application for participation in the program by the 28<sup>th</sup> of February of each year to a competent and independent certification body in which he declares that he:

- knows the guidelines and voluntarily and autonomously adheres to them,
- allows all necessary controls and analyses and
- recognizes the decisions of the certification body.

Integrated production must include the entirety of his pome orchards (environmentally conscious orchardist). All care measures executed after the end of the last harvest are effective for the new harvest and must be transferred into the current orchard register. The regulations and sanctions of the previous guidelines are applicable for all measures executed before these guidelines take effect.

The orchardist must see to it that AGRIOS-properties are not contaminated by forbidden substances (spray remains in the sprayer, spray drift from neighboring properties, etc.).

Each producer or the corresponding marketing organization must submit a current list of the participating fruit production area to the certification body within May 31<sup>st</sup> of each year.

If there are any changes in the cultivation data in regard to planting data or ownership occur after the original report, these are to be reported to the certification body within 15 days.

## Exclusions

**Exclusion from the program** can be effected at the certification body on single properties or the entire orchard.

**Partial exclusion**, that is, exclusion of a part of an orchard, are accepted only when the affected area within a larger area is clearly distinguishable as a (varietal) sector, and when spray drift to bordering rows can be ruled out to a great extent. Clearly distinguishable are, for example, sectors of trees of approximately the same age in at least 5-6 rows, or sectors separated by natural borders such as roads, ditches, or hedges. At application for exclusion, a sketch should be presented in which the sector to be excluded from the program and its immediate environment are clearly drawn in and the size of the sector is easily discernible. The certification body reserves the right to accept the exclusion or to decline it for sectors which are too small. A copy of the exclusion application must be included in the orchard register.



**Voluntary exclusion** must be effected through the marketing organization before or immediately after the implementation of an unauthorized measure. Applications for exclusion can no longer be accepted after notification of a forthcoming inspection or during the inspection itself.

## Implementation of integrated production



### a) Orchard manager

Every producer must appoint an orchard manager who is responsible for the implementation of integrated production, especially for all fertilizer and plant protection treatments. The orchard manager must also ensure that the responsibilities and competences are communicated internally within the organization.

## b) Product procurement

If marketing organizations obtain the products from integrated production directly from the agricultural operation, a supply agreement or a declaration about the estimated crop must be on hand.

If marketing organizations obtain the products from integrated production from other marketing organizations, it must be ascertainable from the transport documents that the products stem from integrated production.

## c) Non-conformity, improvement and preventive measures and complaints

The producers must keep records of detected non-conformities and the associated measures taken. In addition, they must ensure that non-conforming goods are not put into circulation as AGRIOS goods.

The producers must implement and record improvement and preventive measures and appraise their effectiveness.

The producers must record the handling of complaints.

## d) Self-monitoring

The producers must implement self-monitoring of the correct application of the AGRIOS guidelines and document their results. In the case of agricultural producers, this must be accomplished before the controlling of the orchard register.

## e) Internal audit

The marketing organizations must evaluate the effectiveness of the integrated production systems at least once yearly; the evaluation must be carried out by a person not involved in the evaluated activity. As a result of the self-monitoring, the internal audit and eventual complaints and non-conformities, improvement measures must be implemented when necessary.

In the case of agricultural producers, the documentation is checked by the employees of the marketing organization upon handing in the orchard register.

## The orchard register



Orchardists who want to comply with the requirements of integrated production must record all cultivation measures in an **orchard register** in order to establish proof of an environmentally friendly method of production. The orchard register may be maintained in digital or paper form. In the frame of the EU regulation 1234/2007, contributions are granted for these methods of production, in which case the records must be retained for at least 5 years for following examination by organs of the European Union.

In the orchard register, the orchardist keeps a continuous record of the various cultivation methods in his orchard.

The following information must be recorded in the orchard register:



- Identification of the orchard
- Begin of blossoming (for each variety)
- End of blossoming for new orchards
- Start of harvest (for each variety)
- Spray applications: date, product (trade name), amount, reason (i.e. pests, diseases, thinning, etc.)
- Fertilization: date, fertilizer, (trade name), concentration of nutrients, amount
- Herbicides: date, product (trade name), amount
- Control of rodents
- Count of diseases, beneficial and harmful insects

- **Ecological measures effected**

In the orchard register, also the date of the end of blossoming for full-yield orchards can be recorded. If no such date is recorded, the controls will use the date specified by the Department for Horticulture and Viticulture.



The orchard register must be kept up to date and ready at all times for auditing. In addition, the care measures executed after the end of harvest, such as autumn fertilization, use of herbicides or rodent control, must be entered into the current orchard register and transferred to the orchard register for the following year.

## CONTROLS AND SANCTIONS IN THE INTEGRATED PRODUCTION

### Range of controls

#### Farm checks

A specific share (min. 10 %) of the registered participants are controlled during the season by farm checks. The participants to be controlled by farm checks are chosen by the certification body.

#### Checks of drift reducing spray technology

At least 10% of the farm managers will be checked without prior notification during the season to insure the adherence of the spray device to the guidelines.

#### Controls of orchard registers

The orchard registers including the orchard register entries of all orchards are controlled in two phases: the first check is carried out before starting harvest, the second after application of the last spraying.

#### Storage controls

At the beginning of the marketing season, a preliminary examination will be made in each storage facility. During the season, further checkups will be made.

### Content of controls

Controls by the certification body	
Control	Control point
Check of the orchard register and its entries	<ul style="list-style-type: none"> <li>• Completeness of the entries</li> <li>• Compliance with the AGRIOS guidelines</li> </ul>
Check of the plant protection equipment	<ul style="list-style-type: none"> <li>• Participation in a spraying test within the preceding five years</li> <li>• Presence of drift-reducing technology</li> </ul>
Examination of the storage facilities for plant protection substances	<ul style="list-style-type: none"> <li>• Adherence to the regulations concerning the proper storage of plant protection products</li> <li>• Actual inventory of plant protection products (concordance with inventory lists, presence of substances no longer allowed)</li> </ul>

	<ul style="list-style-type: none"> <li>• Adherence to the regulations for proper disposal of empty packaging and obsolete plant protection products</li> </ul>
Control in the orchards	<ul style="list-style-type: none"> <li>• Concurrence of the area controlled with the area registered</li> <li>• Width of the herbicide strips</li> <li>• Execution of ecological measures</li> </ul>
Collection of leaf, fruit, soil and outgrowth samples	<ul style="list-style-type: none"> <li>• Residues of plant protection substances</li> </ul>
Checks of the storage facility	<ul style="list-style-type: none"> <li>• Exact and clear labeling of the AGRIOS products</li> <li>• Traceability of the product flow</li> <li>• Separation of the product circulation</li> </ul>

### Records of controls

At the examination of the producers and the storage facilities, the technician keeps a protocol which each participant receives a copy of. Upon discovery of any nonconformity, the sanctions provided for in the guidelines will be applied.

### Sanctions for the producers

**The non-issuance or the withdrawal of AGRIOS certification for the property/orchard concerned is imposed upon following grounds:**

- From the orchard register the use of substances not allowed in the AGRIOS program is ascertained. If it is only a case of a recording error, the producer can make a written declaration within four calendar days of the discovery and request residue analysis at his own expense. If no residues of the substance in question are found, the certification of the corresponding property occurs. If however the residue analysis confirms the records, the certification of the entire farm is not issued/withdrawn.
- The orchard register shows the use of non-authorized plant protection substances whose active substance is authorized in the AGRIOS program. If this is only a recording error which the producer declares in writing and which can be comprehensibly proven within four calendar days of its discovery through plant protection inventory, delivery receipts and/or invoices, the certification of the lots affected can take place.
- Analyses show residues which exceed the maximum limits allowed by AGRIOS.
- Deficiencies found during the controls have not been corrected within the deadline set.
- In the case of orchards planted as of 2012 immediately bordering on feed, grain or herb crops where the minimum distances were not observed. Exceptions are those cases where, at the date of planting, none of the crops named were verifiably planted on the neighboring property.
- In an orchard which immediately borders upon fodder, cereal or herbal crops, a spray unit without the required drift-reducing equipment was used.
- In the case of orchards planted as of 2013 immediately bordering on feed, grain or herb crops where no barrier was erected on the property line running parallel to the tree rows to reduce spray drift. Exceptions are those cases where, at the date of planting, none of the crops named were verifiably planted on the neighboring property.
- The requirement of taking part in schooling within the stated period of time was not fulfilled.

**The non-issuance or the withdrawal of AGRIOS certification for the entire orchards is imposed upon following grounds:**

- Participation in controls has been refused or a participant fails to appear for controls without excuse.
- Residues of substances not allowed by the program are found in the analyses.
- The orchard register reveals that the ordinances for the protection of bees have been violated in the current and in the previous year.

- The spray device does not fulfill the prescribed requirements for drift-reducing technology.
- The documents presented were manipulated or falsified.

**The non-issuance or the withdrawal of AGRIOS certification for the lots concerned is imposed upon following grounds:**

- When the orchard register shows that waiting periods are not adhered to.

**A warning with the condition that the deficiencies determined be corrected within a certain deadline is delivered in the following cases:**

- When the records in the orchard register are incomplete.
- When documents are missing from the orchard register.
- When the last sprayer test was effected more than 5 years before.
- When the soil analysis is missing or was effected more than 5 years before.
- When the confirmation of registration with an advisory organization is missing.
- When the storage area for plant protection substances contains products which are no longer allowed.
- When the storage area for plant protection substances does not meet regulations.
- When in farm checks the implementation of a measure (plant protection, herbicide, fertilizer) was detected which was not recorded in the orchard register.

**A warning with the condition of attending a course pertaining to the topic within a certain time frame will be imposed in the following cases:**

- When the orchard register shows that restrictions of the program regarding applications have not been followed (i.e. number of applications, final dates for certain substances, maximum dosage, limitations of use of certain plant protection products).
- The orchard register reveals that the application restrictions of the program regarding fertilizer (for example, time of fertilization, maximum amount of nutrients per application or period) have not been adhered to.
- The orchard register shows the use of fertilizers not allowed in the program. If this is only a recording error which the producer declares in writing and which can be comprehensibly proven within four calendar days of its discovery through fertilizer inventory, delivery receipts and/or invoices, the grower must not participate in supplementary training.
- When in the course of residue analyses a substance is found which is allowed by the program but has not been recorded in the orchard register.
- When the orchard register reveals that the ordinances for the protection of bees have been violated in the current year. If a producer also violated these regulations in the previous year, his entire properties not will be certified.
- The certificate of participation in the advanced training course about "Problems and possibilities of action in the cultivation of different crops in close proximity" is missing or more than five years old.
- In the framework of a farm audit, the disregard of guideline regulations (e.g. in appropriate application of mouse bait, inadmissible width of herbicide strips, improper disposal of leftover plant protection substances or waste) is determined.

**An additional check including spot sampling for residue analysis is imposed in the following cases:**

- The orchard register entries are incomplete or seem implausible.  
In the case that the results of the residue analysis confirm the orchard register entries are incomplete, the producer must carry the cost of the additional check and the chemical analysis. If the results of the analysis do not confirm the suspicions, there is no additional cost to the producer.

### **e)Sanctions for the storage facilities**

If any nonconformity is discovered in the storage facility, the following sanctions are provided for:

- The product will be blocked.
- The blocked product must be repacked and/or relabelled.
- The correction measures provided for must be implemented.
- Non-conformity will be relayed to AGRIOS which will apply additional sanctions.



## National guidelines for integrated production 2018-2019

**Crop protection and weed control**  
**G.T.S. „Comitato nazionale per la difesa integrata”**  
**Ministero per le politiche Agricole Alimentari e Forestali**  
**Ministerial Decree Nr. 2722 - 17/4/2008**

### Note on the list:

For distinguish the technical recommendations from the mandatory obligations, the latter are printed in **bold lettering** and with **yellow background**.

DISEASE	CRITERIA FOR INTERVENTION	ACTIVE INGREDIENT	REMARKS AND RESTRICTIONS
<b>Scab</b> <i>(Venturia inaequalis)</i>	<u>Chemical measures</u> Implementation of treatments according to biological cycles or a fixed or prolonged cycle in connection with the weather and the persistence of the fungicide. Interruption or strong limitation of scab treatments after the primary scab season, should no scab infestation be found in the orchard.	Lime sulphur Trifloxystrobin (1) Pyraclostrobin (1) Boscalid (2)(*) Sterol biosynthesis inhibitors (SBI)-see appendix (3) Pyrimetanil (4) Cyprodinil (4) Captan (5) Dithianon (5) Propineb (6) Metiram (6) Mancozeb (6) Fluazinam (7) Dodine (8) Penthiopyrad (9)(*) Copper (10) Fluxapyroxad (11)(*) Potassium phosphonate (12)	(1) <b>A maximum of 3 applications with Strobilurine per year independently of the disease</b> (2) <b>A maximum of 3 applications per year independently of the disease</b> (3) <b>A maximum of 6 applications with SBI per year independently of the disease, additionally a maximum of 2 further applications with Difenconazol against scab, a maximum of 2 applications with Myclobutanil per year</b> (4) <b>A maximum of 3 applications per year</b> (5) <b>Among Captan and Dithianon independently of the disease a maximum of 14 applications per year</b> (6) <b>A maximum of 5 applications with Dithiocarbamates per year, a maximum of 2 applications with Mancozeb only in preblossom, leftovers of Propineb may be used up until 22 June 2019</b> (7) <b>A maximum of 4 applications per year independently of the disease</b> (8) <b>A maximum of 3 applications per year independently of the disease</b> (9) <b>A maximum of 2 applications per year independently of the disease</b> (10) <b>A maximum of 4 kg of pure copper per ha and year, including fertilizers containing copper. For every application of Mancozeb, the total amount of pure copper allowed is reduced by 0.5 kg per ha</b> (11) <b>A maximum of 3 applications per year independently of the disease</b> (12) <b>A maximum of 6 applications per year independently of the disease</b>

DISEASE	CRITERIA FOR INTERVENTION	ACTIVE INGREDIENT	REMARKS AND RESTRICTIONS
<b>Mildew</b> <i>(Podosphaera leucotricha, Oidium farinosum)</i>	<u>Agronomic measures</u> Removal of afflicted buds during winter pruning Pruning of afflicted shoots in spring-summer <u>Chemical measures</u> Preventative treatment of susceptible varieties and slope or hill locations beginning pre-blossom, less susceptible varieties in valley locations beginning at the first signs of infestation.	Sulphur Sterol biosynthesis inhibitors (SBI)-see appendix (1) Pyraclostrobin (2) Boscalid (3)(*) Trifloxystrobin (2) Quinoxifen (4) Cyflufenamid (5) Penthiopyrad (6)(*) Bupirimate (7) Fluxapyroxad (8)(*) Meptyldinocap (9) Potassium hydrogen carbonate	(3) A maximum of 6 applications with SBI per year independently of the disease, additionally a maximum of 2 further applications with Difenconazol against scab, a maximum of 2 applications with Myclobutanil per year (2) A maximum of 3 applications with Strobilurine per year independently of the disease (3) A maximum of 3 applications per year independently of the disease (4) A maximum of 2 applications per year independently of the Disease, leftovers may be used up within 2019 (5) A maximum of 2 applications per year independently of the disease (6) A maximum of 2 applications per year independently of the disease (7) A maximum of 4 applications per year independently of the disease (8) A maximum of 3 applications per year independently of the disease (9) A maximum of 2 applications per year independently of the disease, only from mouse-ear stage to the begin of blossom
<b>European Canker</b> <i>(Nectria galligena)</i>	<u>Chemical measures</u> Normally treatment is implemented in fall shortly before leaf fall and in spring at the first swelling of buds. In young and badly infested orchards, it is sensible to treat during leaf fall.	Copper (1)	(1) A maximum of 4 kg of pure copper per ha and year, including fertilizers containing copper. For every application of Mancozeb, the total amount of pure copper allowed is reduced by 0.5 kg per ha.
<b>Collar Rot</b> <i>(Phytophthora spp.)</i>	<u>Chemical measures</u> <b>Limit treatment to afflicted zones</b> Treatment starting at begin of vegetation period. Avoid bad drainage.	Copper (1) Fosethyl Aluminium	A maximum of 2 applications per year against this disease (1) A maximum of 4 kg of pure copper per ha and year, including fertilizers containing copper. For every application of Mancozeb, the total amount of pure copper allowed is reduced by 0.5 kg per ha.

DISEASE	CRITERIA FOR INTERVENTION	ACTIVE INGREDIENT	REMARKS AND RESTRICTIONS
<b>Fruit Rot</b> ( <i>Gloeosporium album</i> )	Chemical measures <b>Only pre-harvest treatments</b>	Captan (1) Pyraclostrobin (2) + Boscalid (3)(*) Thiram (4) Fludioxonil (5)	(1) Among Captan and Dithianon independently of the disease, a maximum of 14 applications per year (2) A maximum of 3 applications with Strobilurine per year independently of the disease (3) A maximum of 3 applications per year independently of the disease (4) A maximum of 5 applications with Dithiocarbamates per year leftovers may be used up until 30 April 2019 (5) A maximum of 2 applications per year independently of the disease
<b>Fire blight</b> ( <i>Erwinia amylovora</i> )	<b>Intervention level</b> <b>See notes of the local advisory board.</b>	Bacillus subtilis Aureobasidium pullulans Acibenzolar-S-methyl Bacillus amyloliquefaciens	
<b>Alternaria</b> ( <i>Alternaria spp.</i> )	Chemical measures <b>Only pre-harvest treatments</b>	Pyraclostrobin (1) Boscalid (2)(*) Thiram (3) Fludioxonil (4) Penthiopyrad (5)(*) Fluazinam (6)	(1) A maximum of 3 applications with Strobilurine per year independently of the disease (2) A maximum of 3 applications per year independently of the disease (3) A maximum of 5 applications with Dithiocarbamates per year leftovers may be used up until 30 April 2019 (4) A maximum of 2 applications per year independently of the disease (5) A maximum of 2 applications per year independently of the disease (6) A maximum of 4 applications per year independently of the disease
<b>Remark: authorized SBI: Penconazol, Tetraconazol, Difenconazol, Myclobutanil.</b>			
<b>(*)Independently of the disease a maximum of 4 applications per year with Boscalid, Fluxapyroxad and Penthiopyrad</b>			

PEST	CRITERIA FOR INTERVENTION	ACTIVE INGREDIENT	REMARKS AND RESTRICTIONS
<b>San José Scale</b> ( <i>Comstockaspis perniciosa</i> )	<b>Intervention level</b> <b>Presence</b> <b>If present, treatment at the end of winter when larvae emerge.</b>	Mineral oil Phosmet (1) Chlorpyrifos-methyl (1) Pyriproxyfen (2) Spirotetramat (3)	<b>(1) A maximum of 4 applications with Organophosphorus per year independently of the pest, a maximum of 2 applications with Phosmet per year, a maximum of 2 applications with Chlorpyrifos-methyl per year</b> Side-effect on may bug, garden chafer and apple clearwing moth <b>(2) A maximum of 1 application per year independently of the pest, only in pre-blossom</b> <b>(3) A maximum of 2 applications per year independently of the pest</b>
<b>Cicadas</b>	<b>Intervention level</b> <b>Presence</b>	Etofenprox (1)	<b>(1) A maximum of 2 applications per year independently of the pest, additionally a maximum of 1 further application if used against Brown marmorated stink bug, a maximum of 1 application in pre-blossom and a maximum of 2 applications in post-blossom</b>
<b>Rosy Apple Aphid</b> ( <i>Dysaphis plantaginea</i> )	<b>Intervention level</b> <b>Presence</b>	Tau-Fluvalinate (1) Acetamiprid (2) Flonicamid (3) Azadirachtin Pirimicarb Spirotetramat (4) Sulfoxaflor (5)	<b>(1) A maximum of 2 applications per year independently of the pest</b> <b>(2) A maximum of 1 application per year independently of the pest, additionally a maximum of 1 further application if used against May bugs, Brown marmorated stink bug or Mediterranean fruit fly</b> <b>(3) A maximum of 1 application per year independently of the pest</b> <b>(4) A maximum of 2 applications per year independently of the pest</b> <b>(5) A maximum of 1 application with 400 ml/ha or 2 applications with 200 ml/ha per year</b>

PEST	CRITERIA FOR INTERVENTION	ACTIVE INGREDIENT	REMARKS AND RESTRICTIONS
<b>Tortrix Moth</b> <i>(Pandemis cerasana,</i> <i>Archips podanus,</i> <i>Adoxophyes orana,</i> <i>Pandemis heparana)</i>	<b>Intervention level</b> <b>Post-blossom: 2 larvae/100 shoots</b> <b>Summer: 3 larvae/500 fruits</b>	Mating disruption Bacillus thuringiensis Tebufenozid (*) Methoxyfenozid (*) Chlorpyrifos-methyl (1) Spinosad (2) Spinetoram (2) Indoxacarb (3) Chlorantraniliprole (4) Emamectin benzoat (5)	<b>Internal pheromone traps or monitoring net</b> <b>(1) A maximum of 4 applications with Organophosphorus per year independently of the pest, a maximum of 2 applications with Chlorpyrifos-methyl per year</b> Side-effect on may bug, garden chafer and apple clearwing moth
			<b>(2) A maximum of 3 applications per year independently of the pest, a maximum of 1 application with Spinetoram per year</b> <b>(3) A maximum of 4 applications per year independently of the pest</b> Side-effect on winter moths and noctuids <b>(4) A maximum of 2 applications per year independently of the pest</b> <b>(5) A maximum of 2 applications per year independently of the pest</b>
<b>Codling Moth</b> <i>(Cydia pomonella)</i>	Give preference to disruption methods for treatment.  <b>Intervention level</b> <b>After checking at least 500 fruits per hectare, count the number of boreholes:</b> <b>June - 3 bored fruits/1.000</b> <b>July - 5 bored fruits/1.000</b> <b>August - 8 bored fruits/1.000</b>	Mating disruption Granulose virus Methoxyfenozid (*) Tebufenozid (*) Triflumuron (6)(*) Spinosad (1) Sinetoram (1) Phosmet (2) Thiacloprid (3) Chlorantraniliprole (4) Emamectin benzoat(5)	<b>Internal pheromone traps or monitoring net</b> <b>(1) A maximum of 3 applications per year independently of the pest, a maximum of 1 application with Spinetoram per year</b> <b>(2) A maximum of 4 applications with Organophosphorus per year independently of the pest, a maximum of 2 applications with Phosmet per year</b> Side-effect on may bug, garden chafer and apple clearwing moth
			<b>(3) A maximum of 1 application per year independently of the pest</b> <b>(4) A maximum of 2 applications per year independently of the pest</b> <b>(5) A maximum of 2 applications per year independently of the pest</b> <b>(6) A maximum of 2 applications per year independently of the pest</b>
<b>Oriental Fruit Moth</b> <i>(Cydia molesta,</i> <i>Grapholita molesta)</i>	<b>Intervention level</b> <b>Egg deposition or 1% boreholes upon checking at least 100 fruits/ha</b>	Bacillus thuringiensis Mating disruption Methoxyfenozid (*) Triflumuron (4)(*) Spinosad (1) Sinetoram (1) Chlorantraniliprole (2) Emamectin benzoat (3)	<b>(1) A maximum of 3 applications per year independently of the pest, a maximum of 1 application with Spinetoram per year</b> <b>(2) A maximum of 2 applications per year independently of the pest</b> <b>(3) A maximum of 2 applications per year independently of the pest</b> <b>(4) A maximum of 2 applications per year independently of the pest</b>

PEST	CRITERIA FOR INTERVENTION	ACTIVE INGREDIENT	REMARKS AND RESTRICTIONS
<b>Leaf Miners</b> <i>(Lithocolletis blancardella)</i> <i>(Leucoptera scitella)</i> <i>(Phyllonorycter corylifoliella)</i> <i>(Lyonetia clerkella)</i>	<b>Intervention level</b> <b>Ribbed Apple Leaf Miner:</b> <b>5-6 mines per tree</b> <b>Spotted Tentiform Leaf Miner:</b> <b>1 mine per long shoot</b> <b>Hawthorn Red Midget Moth:</b> <b>1 mine per long shoot</b> <b>Apple Leaf Miner: 1 mine per long shoot</b>	Acetamiprid (1) Spinosad (2) Spinetoram (2) Chlorantraniliprole (3) Emamectin benzoate(4)	<b>(1) A maximum of 1 application per year independently of the pest, additionally a maximum of 1 further application if used against May bugs, Brown marmorated stink bug or Mediterranean fruit fly</b> <b>(2) A maximum of 3 applications per year independently of the pest, a maximum of 1 application with Spinetoram per year</b> <b>(3) A maximum of 2 applications per year independently of the pest</b> <b>(4) A maximum of 2 applications per year independently of the pest</b>
<b>Leopard Moth</b> <i>(Zeuzera pyrina)</i>		Mating disruption	
<b>Red Spider Mite</b> <i>(Panonychus ulmi)</i> <b>Twospotted Spider Mite</b> <i>(Tetranychus urticae)</i>	<b>Intervention level</b> <b>See notes of the local advisory board.</b>	Pyridaben Etoxazol Hexythiazox Tebufenpyrad Milbemectin Abamectin (1) Mineraloil Acequinocyl (2)	<b>Against these pests a maximum of 2 applications per year, treatments with mineral oil are not included in this limit.</b> <b>(1) A maximum of 1 application per year independently of the pest</b> <b>(2) A maximum of 1 application per year independently of the pest</b>
<b>Apple Rust Mite</b> <i>(Aculus schlechtendali)</i>		Abamectin (1) Mineraloil Spirodiclofen (2)	<b>(1) A maximum of 1 application per year independently of the pest</b> <b>(2) A maximum of 1 application per year independently of the pest</b>
<b>Greene Apple Aphid</b> <i>(Aphis pomi)</i>		Pirimicarb Azadirachtin Acetamiprid (1) Flonicamid (2) Spirotetramat (3)	<b>(1) A maximum of 1 application per year independently of the pest, additionally a maximum of 1 further application if used against May bugs, Brown marmorated stink bug or Mediterranean fruit fly</b> <b>(2) A maximum of 1 application per year independently of the pest</b> <b>(3) A maximum of 2 applications per year independently of the pest</b>

PEST	CRITERIA FOR INTERVENTION	ACTIVE INGREDIENT	REMARKS AND RESTRICTIONS
<b>Woolly Apple Aphid</b> ( <i>Eriosoma lanigerum</i> )	<b>Intervention level</b> <b>10 living colonies on checking</b> <b>100 afflicted organs</b> Check presence of <i>A. mali</i> wasps which can effectively reduce infestation.	Acetamiprid (1) Pirimicarb Spirotetramat (2)	(1) A maximum of 1 application per year independently of the pest, additionally a maximum of 1 further application if used against May bugs, Brown marmorated stink bug or Mediterranean fruit fly (2) A maximum of 2 applications per year independently of the pest
<b>Psyllids</b> ( <i>Cacopsylla melanoneura</i> ) ( <i>Cacopsylla picta</i> )		Etofenprox (1) Tau-Fluvalinate (2) Phosmet (3)	(1) A maximum of 2 applications per year independently of the pest, additionally a maximum of 1 further application if used against Brown marmorated stink bug, a maximum of 1 application in pre-blossom and a maximum of 2 applications in post-blossom Side effect on apple blossom weevil (2) A maximum of 2 applications per year independently of the pest (3) A maximum of 4 applications with Organophosphorus per year independently of the pest, a maximum of 2 applications with Phosmet per year Side-effect on may bug, garden chafer and apple clearwing moth
<b>May Bug</b> ( <i>Melolontha melolontha</i> )	<b>Intervention level</b> <b>See notes of the local advisory board, only in years of mass flight.</b>	Acetamiprid (1)	(1) A maximum of 1 application per year independently of the pest, additionally a maximum of 1 further application if used against May bugs, Brown marmorated stink bug or Mediterranean fruit fly
<b>Mediterranean fruit fly</b> ( <i>Ceratitis capitata</i> )	<b>Intervention level</b> <b>Presence of the first puncture holes</b>	Acetamiprid (1) Phosmet (2) Etofenprox (3)	(1) A maximum of 1 application per year independently of the pest, additionally a maximum of 1 further application if used against May bugs, Brown marmorated stink bug or Mediterranean fruit fly (2) A maximum of 4 applications with Organophosphorus per year independently of the pest, a maximum of 2 applications with Phosmet per year Side-effect on may bug, garden chafer and apple clearwing moth (3) A maximum of 2 applications per year independently of the pest, additionally a maximum of 1 further application if used against Brown marmorated stink bug, a maximum of 1 application in pre-blossom and a maximum of 2 applications in post-blossom

PEST	CRITERIA FOR INTERVENTION	ACTIVE INGREDIENT	REMARKS AND RESTRICTIONS
<b>Brown marmorated stink bug</b> <i>(Halyomorpha halys)</i>	<b>Intervention level</b> <b>See notes of the local advisory Board.</b>	Acetamiprid (1) Phosmet (2) Chlorpyrifos-methyl (2) Tau-Fluvalinate (3) Etofenprox (4)	<b>(1) A maximum of 1 application per year independently of the pest, additionally a maximum of 1 further application if used against May bugs, Brown marmorated stink bug or Mediterranean fruit fly</b>
			<b>(2) A maximum of 4 applications with Organophosphorus per year independently of the pest, a maximum of 2 applications with Phosmet per year, a maximum of 2 applications with Chlorpyrifos-methyl per year</b> Side-effect on may bug, garden chafer and apple clearwing moth
			<b>(3) A maximum of 2 applications per year independently of the pest</b>
			<b>(4) A maximum of 2 applications per year independently of the pest, additionally a maximum of 1 further application if used against Brown marmorated stink bug, a maximum of 1 application in pre-blossom and a maximum of 2 applications in post-blossom</b>
<b>(**)Independently of the pest a maximum of 3 applications per year with: Methoxyfenozyd, Tebufenozyd and Triflumuron (Methoxyfenozyd: Side-effect on winter moths and noctuids)</b>			



WEEDS	CRITERIA FOR INTERVENTION	ACTIVE INGREDIENTS	%	g per l/kg	DOSAGE l/ha/YEAR
Grasses and dicotyledonian weeds	<u>Agronomic measures</u> Use of plant cover, mowing, mulching and/or ground tillage				Independently of the number of treatments per year are allowed:  l/ha = 9  l/ha = 1,5  l/ha = 4  l/ha = 1,875  l/ha = 1
	<b>Not allowed: tillage of the alleys in orchards with irrigation</b>				
	<u>Chemical measures</u>	Glyphosate	30,4	360	
	<b>Chemical treatment of the alleys is not allowed.</b>				
	Use in rows limited, use of low doses in the early developmental stages of the weeds. Repeat treatments if necessary. Fall treatments recommended.	MCPA	25	280	
	The use of herbicides can be meaningful if: - the distance in the row between individual trees is less than 1.5-2 m - the trees have root systems above ground (i.e. quince rootstocks and BA29 for pears - M9 and M26 for apples). - there is danger of erosion (i.e. gradient above 5%). - low branches and small plots do not allow for mechanical measures.	Oxadiazon (1)	34	380	
	Oxyfluorfen (2)	22,9	240		
	Carfentrazon ethyl	6,45	60		
	<b>Weed control must be confined to the tree row. The treated area may not exceed 50% of the total area.</b>				
	<b>(1) The use is only permitted in the first 3 years after planting. (2) The use is only permitted within the period from the last decade of September to the first decade of May. To be used with a reduced dosage (0,3 - 0,45 l for each application) in a mixture with systemic products.</b>				

**GROWTH REGULATORS**

<b>EFFECT</b>	<b>APPLICABLE SUBSTANCES</b>	<b>COMMENTS AND APPLICATION RESTRICTIONS</b>	<b>AGRONOMIC ALTERNATIVES (SUGGESTION)</b>
Fruit set	Gibberelline (A4+A7) Gibberelline (A4+A7) + 6-Benziladenin	Application only in the case of frost damage risk	Use of bees and bumblebees
Prevention of premature fruit fall	NAA	Product use recommended only when taking account of objective local parameters (variety, weather conditions, degree of ripeness)	
Prevention of fruit russetting	Gibberelline (A4+A7) Gibberelline (A4+A7) + 6-Benziladenin		
Restriction of growth (regulation of the growth process of the plant)	Prohexadion calcium		
	NAA	Only under unfavorable weather conditions	
Thinning	6-Benziladenin		With supplementary manual thinning
	NAA		With supplementary manual thinning
	6-Benziladedin + NAA		With supplementary manual thinning
	NAD		With supplementary manual thinning
	Etefon		With supplementary manual thinning
	Metamitron	A maximum o 2 applications per year	With supplementary manual thinning
Promoting uniform fruit shape	Gibberelline (A4+A7) Gibberelline (A4+A7) + 6-Benziladenin		With supplementary manual thinning

## Active ingredient list for integrated pome production 2019

The maximum dosages in the following list were obtained from the plant protection labels available at the time of authorization; no liability is assumed for possible errors or fallacies. The dosages of some plant protection substances differ according to the pests/diseases to be treated or according to the time of treatment. The corresponding specifications on the labels should be heeded.

### INSECTICIDES

Active ingredient	Trade name	Max. applic. per year	Maximum dosage		Waiting period (in days)	Remarks
			per hl	per ha		
Acetamiprid	Epik, Epik SL	2	150 g	2 kg	14	A maximum of 1 application per year is allowed. To control May bugs in years of mass flight, Brown marmorated stink bug or Mediterranean fruit fly a maximum of 1 further application is allowed.
		2	150 ml	2 l	14	
Azadirachtin	Diractin, Neemazal-T/S, Neemik Ten, Oikos	3	150 ml	1,5 l	3	
		-	300 ml	3 l	3	
		3	400 ml	3,9 l	3	
		3	150 ml	1,5 l	3	
Bacillus thuringiensis	Agree, Bactospeine 32 WG, Biobit DF, Biolarv, CoStar WG, Delfin, Design WG, Dipel DF, Florbac WG, Kristal 32 WG, Lepiback, Lepinox Plus, Primial WG, Rapax, Sequra WG, Turex, Turibel, XenTari WG	3	200 g	2 kg	0	
		8	100 g	1,5 kg	0	
		8	100 g	1,5 kg	0	
		2	125 g	1 kg	3	
		6	100 g	1,5 kg	0	
		6	100 g	1 kg	0	
		3	200 g	2 kg	0	
		8	100 g	1,5 kg	0	
		4	100 g	1,5 kg	0	
		8	100 g	1,5 kg	0	
		2	125 g	1 kg	3	
		-	-	1,5 kg	0	
		8	100 g	1,5 kg	0	
		3	-	2 l	0	
8	100 g	1,5 kg	0			
3	200 g	2 kg	0			
2	125 g	1 kg	3			
4	100 g	1,5 kg	0			
Beauveria bassiana	Naturalis	-	-	2 l	0	
<u>Chitin synthesis inhibitors + Moulting accelerating compounds:</u> Methoxyfenozid	Gladiator, Intrepid, Prodigy	3	40 ml	0,6 l	14	A maximum of 3 applications with products from this group per year is allowed.
Tebufenozid		3	40 ml	0,6 l	14	
		3	40 ml	0,6 l	14	
		2	80 ml	0,9 l	14	
Triflumuron	Alsystin	2	25 ml	0,375 l	28	

Chlorantraniliprol	Coragen	2	20 ml	0,3 l	14	A maximum of 2 applications per year is allowed.
Emamectin benzoat	Affirm, Affirm Opti	2	300 g	4 kg	7	A maximum of 2 applications per year is allowed.
		2	150 g	2 kg	7	
Etofenprox	Trebon up	3	50 ml	0,75 l	7	A maximum of 2 applications per year is allowed. To control Brown marmorated stink bug a maximum of 1 further application is allowed. A maximum of 1 application in pre-blossom, a maximum of 2 applications in post-blossom.
Flonicamid	Flonic, Teppeki	1	-	0,14 kg	21	A maximum of 1 application per year is allowed.
		1	-	0,14 kg	21	
Granulose virus	Capex 100,	6	-	0,1 l	3	
	Carpstop,	3	50 ml	0,75 l	3	
	Carpovirusine Plus,	-	100 ml	1 l	1	
	CYD-X,	9	-	0,12 l	3	
	CYD-X X-TRA,	9	-	0,12 l	1	
	Madex 100,	-	12 ml	0,12 l	3	
	Madex Top,	10	-	0,1 l	3	
	Madex Twin, Virgo	12 3	- 50 ml	0,1 l 0,75 l	3 3	
Indoxacarb	Avaunt EC, Steward	4	33 ml	0,5 l	7	A maximum of 4 applications per year is allowed, only until 60 days before the start of harvest.
		4	16,5 g	0,2475 kg	7	
Mating disruption	Checkmate CM-XL,	-	-	300 pcs.	0	
	Checkmate Puffer CM,	-	-	3 pcs.	0	
	Cidetrak CM,	-	-	500 pcs.	0	
	Cidetrak OFM,	-	-	425 pcs.	0	
	Isomate C LR,	-	-	1000 pcs.	0	
	Isomate CLR Max TT	-	-	750 pcs.	0	
	Isomate C/OFM,	-	-	1000 pcs.	0	
	Isomate C plus,	-	-	1000 pcs.	0	
	Isomate C TT,	-	-	500 pcs.	0	
	Isomate CM Mister 1.0,	-	-	3 pcs.	0	
	Isomate OFM rosso Flex,	-	-	600 pcs.	0	
	Isonet Z,	-	-	300 pcs.	0	
	Rak 3,	-	-	900 pcs.	0	
Rak 3+4	-	-	900 pcs.	0		
Mineral oil	Albene,	-	3000 ml	-	20	
	Biolid E.,	-	2000 ml	-	20	
	Biolid up,	-	2000 ml	-	20	
	Chemol,	-	3000 ml	-	20	

	Eko Oil Spray, Oleoter, Oliocin, Opalene, Ovipron Top, Ovispray, Polithiol, Sipcamol E, Ultra Fine Oil, Vernoil	- - - - 4 - - - - -	3500 ml - 3500 ml 3000 ml 3500 ml 2500 ml 5000 ml 3500 ml 2500 ml 3500 ml	- 60 l - - 35 l 37,5 l 75 l - 37,5 l 35 l	20 20 20 20 20 1 Dormancy 20 1 20	
<u>Organophosphorus:</u>						
Chlorpyriphos- methyl	Reldan LO, Runner LO	2 2	250 ml 250 ml	5 l 5 l	21 21	A maximum of 4 applications with Organophosphorus per year is allowed. A maximum of 2 applications with Chlorpyriphos-methyl per year is allowed.
Phosmet	Imidan 23,5 WDG, Spada 50 WG, Spada WDG, Suprafos EC	2 2 2 2	319 g 150 g 319 g 375 ml	3,19 kg 1,5 kg 3,19 kg 3,75 l	28 28 28 28	A maximum of 2 applications with Phosmet per year is allowed.
Pirimicarb	Aphox, Pirimor 17,5	1 1	200 g 200 g	2,2 kg 2,2 kg	7 7	
Potassium fatty acids	Ciopper, Flipper, Nobil	5 5 5	2000 ml 2000 ml 2000 ml	20 l 20 l 20 l	0 0 0	
Pyrethrins	Biopiren Plus, Several	- -	200 ml 200 ml	- -	2 2	
Pyriproxyfen	Admiral Gold, Atominal Gold, Juvinal Gold, Lascar, Maracana, Promex, rembò 10 EC	1 1 1 1 1 1 1	40 ml 40 ml 40 ml 50 ml 50 ml 50 ml 50 ml	0,6 l 0,6 l 0,6 l 0,5 l 0,5 l 0,5 l 0,5 l	Start blossom Start blossom Start blossom Start blossom Start blossom Start blossom Start blossom	A maximum of 1 application per year is allowed, only in pre-blossom.
<u>Spinosyne</u>						
Spinetoram	Delegate WDG	1	-	0,4 kg	7	A maximum of 1 application with Spinetoram per year is allowed, a maximum of 3 applications with Spinosyne per year is allowed.
Spinosad	Laser, Success, Tracer 120	3 3 3	30 ml 120 ml 120 ml	0,45 l 1,8 l 1,8 l	7 7 7	
Spirotetramat	Movento 48 SC	2	300 ml	4,5 l	21	A maximum of 2 applications per year is allowed.
Sulfoxaflor	Closer	2	-	0,4 l	7	A maximum of 1 application with 400 ml/ha or 2 applications with 200 ml/ha per year is allowed.
Tau-Fluvalinate	Klartan 20 EW, Mavrik 20 EW, Megic 240	2 2 2	120 ml 120 ml 120 ml	0,6 l 0,6 l 0,6 l	30 30 30	A maximum of 2 applications per year is allowed.

Thiacloprid	Calypso	1	25 ml	0,375 l	14	A maximum of 1 application per year is allowed.
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## ACARICIDES

Active ingredient	Trade name	Max. applic. per year	Maximum dosage		Waiting period (in days)	Remarks
			per hl	per ha		
Abamectin	Amectin EC,	1	80 ml	0,96 l	3	A maximum of 1 application with Abamectin per year is allowed.
	Belpromec,	1	80 ml	0,96 l	3	
	Cal-Ex 1.9 EC,	1	80 ml	0,96 l	3	
	Dynamec EC,	1	75 ml	1,125 l	28	
	Impero,	1	75 ml	1,5 l	28	
	Marisol,	1	75 ml	1,5 l	28	
	Pickill EC,	1	75 ml	1,125 l	28	
	Pivak 1,9 EW,	1	80 ml	0,96 l	3	
	Vertimec EC,	1	75 ml	1,125 l	28	
	Vertimec Pro,	1	75 ml	1,2 l	28	
	Zamir 18,	1	75 ml	1,125 l	28	
	Zepex 1,9 EW,	1	80 ml	0,96 l	3	
	Zetor	1	80 ml	0,96 l	3	
Acequinocyl	Kanemite	1	180 ml	1,8 l	30	A maximum of 1 application with Acequinocyl per year is allowed.
Etoxazol	Borneo, Swing ex-tra	1	50 ml	0,5 l	28	A maximum of 1 application with Etoxazol per year is allowed.
		1	50 ml	0,5 l	28	
Hexythiazox	Diablo SC,	1	30 ml	0,3 l	28	A maximum of 1 application with Hexythiazox per year is allowed.
	Matacar FL,	1	36 ml	0,36 l	28	
	Nissorun,	1	90 g	1 kg	28	
	Picker SC,	1	30 ml	0,3 l	28	
	Ragnostop 10 WP,	1	-	0,5 kg	28	
	Tenor SC, Vittoria 24 SC	1	30 ml 30 ml	0,3 l 0,3 l	28 28	
Milbemectin	Milbeknock	-	125 ml	1,875 l	14	A maximum of 1 application with Pyridaben per year is allowed.
Pyridaben	Nexter	1	75 ml	1 l	14	
Spirodiclofen	Envidor 240 SC	1	50 ml	0,6 l	14	A maximum of 1 application with Spirodiclofen per year is allowed.
Tebufenpyrad	Masai 20 WP	1	-	0,5 kg	7	A maximum of two treatments against spider mites are allowed per year, though treatments using mineral oil are not included in this limit.

## FUNGICIDES

Active ingredient	Trade name	Max. applic. per year	Maximum dosage		Waiting period (in days)	Remarks
			per hl	per ha		
<u>Anilino-pyrimidines:</u> Cyprodinil Pyrimethanil	Chorus	3	50 g	0,75 kg	21	A maximum of 3 applications with Anilino-pyrimidines per year is allowed.
	Brezza,	3	100 ml	1,5 l	56	
	Pyrus 400 SC,	3	70 ml	1 l	56	
	Scala	3	100 ml	1,5 l	56	
Aureobasidium pullulans	Blossom Protect	-	-	1,5 kg	0	
Bacillus amylo-liquefaciens	Amylo-X	6	-	2,5 kg	0	A maximum of 6 applications per year is allowed.
Bacillus subtilis	Serenade Max	4	-	4 kg	3	A maximum of 4 applications per year is allowed.
Bupirimate	Nimrod 250 EW	4	60 ml	0,9 l	14	Only apples, a maximum of 4 applications per year is allowed.
<u>Captan and Dithianon:</u> Captan	Avenger,	7	-	1,88 kg	21	A maximum of 14 applications with products from this group per year is allowed.
	Captain 80 WG,	7	-	1,88 kg	21	
	Captan Arvesta 80 WG,	10	180 g	2 kg	21	
	Khapo 80 WG,	7	-	1,88 kg	21	
	Malvin 80 WG,	10	180 g	2 kg	21	
	Merpan 80 WDG,	10	160 g	2 kg	21	
	Micospor MGD,	10	180 g	2 kg	21	
	Sarcap 800,	10	160 g	2 kg	21	
	Tetracap 80 DG	10	160 g	2 kg	21	
Dithianon	Delan 70 WG,	6	50 g	0,75 kg	42	
	Delan SC	6	70 ml	1,05 l	56	
Dithianon + Potassium phosphonates	Delan Pro	6	170 ml	2,5 l	35	A maximum of 6 applications with Potassium phosphonates is allowed.
<u>Carboxamides:</u> Boscalid	Cantus	3	25 g	0,375 kg	7	A maximum of 3 applications per year with Boscalid is allowed.
Fluxapyroxad	Sercadis	3	20 ml	0,3 l	35	A maximum of 3 applications per year with Fluxapyroxad is allowed.
Penthiopyrad	Fontelis	2	75 ml	1,125 l	21	A maximum of 2 applications per year with Penthiopyrad is allowed. A maximum of 4 applications per year with Carboxamides is allowed.
Copper	Airone Più, Bordo Isagro WG, Bordoflow New,	- - 10	610 g 830 g 1200 ml	9,28 kg 14,94 kg 12 l	Start blossom Start blossom 7	A maximum of 4 kg of pure copper are allowed per hectare and year, including

	Cobre Nordox Super 75 WG,	-	300 g	-	Start blossom	fertilizers containing copper. For every application of Mancozeb, the total amount of pure copper allowed is reduced by 0.5 kg/ha/year. In the case of one treatment with Mancozeb, the maximum amount of pure copper allowed is thereby 3.5 kg/ha/year, with two treatments it is reduced to 3 kg/ha/year. The valid waiting period for all products containing copper not listed here must be respected.
	Coprantol Hi Bio 2.0,	-	210 g	3,2 kg	Start blossom	
	Coprantol WG,	-	500 g	9 kg	Start blossom	
	Cupro Isagro WG,	-	450 g	8,1 kg	Start blossom	
	Cuprocaffaro Micro,	-	450 g	8,1 kg	Start blossom	
	Cuprofix Ultra Disperss,	-	600 g	9 kg	7	
	Cuprosar 40 WDG,	-	600 g	6 kg	Start blossom	
	Cuprossil Idro 25 WP,	17	260 g	2,2 kg	21	
	Cuprotek Disperss,	-	1500 g	-	7	
	Cuproxat SDI,	-	800 ml	-	Start blossom	
	Cutril Top,	-	800 ml	12 l	Start blossom	
	Flowbrix,	-	500 ml	9 l	Start blossom	
	Funguran-OH 250 SC,	-	480 ml	8,64 l	Start blossom	
	Grifon Più,	-	610 g	9,28 kg	Start blossom	
	Heliocuivre,	-	350 ml	3,5 l	Start blossom	
	Hydroram Progress,	12	245 g	3,675 kg	Start blossom	
	Idrorame 193,	-	700 ml	-	40	
	Idrorame Flow,	-	700 ml	-	40	
	Idrox 20,	-	210 g	3,2 kg	Start blossom	
	Iperion,	-	450 g	8,1 kg	Start blossom	
	Iram 025,	-	800 g	-	Start blossom	
	King,	-	350 ml	3,5 l	21	
	King 360 HP,	-	350 ml	3,5 l	21	
	Kocide 2000,	-	250 g	-	Start blossom	
	Kop-Twin,	-	420 ml	4,2 l	21	
	Neoram Blu WG,	-	500 g	9 kg	Start blossom	
	Ossiclor 20 Flow,	8	420 ml	4,2 l	21	
	Ossiclor 35 WG,	8	340 g	3,4 kg	21	
	Ossiclor 35 WG Green,	8	340 g	3,4 kg	21	
	Pasta Caffaro NC,	12	300 ml	3,5 l	21	
	Pasta Isagro Blu	12	300 ml	3,5 l	21	
	Pasta Siapa F NC,	12	300 ml	3,5 l	21	
	Patrol 35 WP,	10	260 g	2,2 kg	21	
	Poltiglia Bordoiese Disperss,	-	1500 g	-	7	
	Poltiglia Bordoiese SCAM D.F.,	-	600 g	-	Start blossom	
	Poltiglia Caffaro 20 DF New,	-	830 g	14,94 kg	Start blossom	
	Poltiglia Caffaro 20 GD,	-	850 g	15,3 kg	Start blossom	
	Poltiglia Disperss,	-	1500 g	-	7	
	Poltiglia 20 PB Manica,	8	625 g	6 kg	7	
	Rame Isagro WG Blu,	-	500 g	9 kg	Start blossom	
	Ramin 30 DF,	12	170 g	2,55 kg	Start blossom	
	S. Ramedit Blu WG,	-	500 g	9 kg	Start blossom	
	Selecta Disperss,	-	1500 g	-	7	
	Siamam 20 GD,	-	850 g	15,3 kg	Start blossom	
	Siamam 20 WG,	-	830 g	14,94 kg	Start blossom	
	Tri-Base,	-	800 ml	9,6 l	Start blossom	
	Zetaram 20 L,	4	310 ml	2,6 l	Start blossom	
	Zetaram Hi Tech	-	210 g	3,2 kg	Start blossom	
Cyflufenamid	Cidely,	2	50 ml	0,5 l	14	A maximum of 2 applications per year is allowed.
	Rebel Top	2	50 ml	0,5 l	14	
<u>Dithio-</u> <u>carbamates:</u> Mancozeb	Deneb 75 DG,	2	250 g	2,1 kg	28	A maximum of 2 applications with Mancozeb per year is
	Dithane DG Neotec,	2	200 g	2 kg	28	
	M 70 DF,	2	250 g	2,1 kg	28	
	Mantir DG,	2	200 g	2 kg	28	



Metiram	Micozeb 75 WDG,	2	200 g	2 kg	28	allowed, only in pre-blossom.  A maximum of 3 applications with Metiram per year is allowed.
	Penncozeb DG,	2	250 g	2,1 kg	28	
	Vondozeb DG	2	250 g	2,1 kg	28	
	Polyram DF	3	200 g	2,6 kg	21	
Propineb	Antracol 70 WG	3	150 g	2,25 kg	End blossom	A maximum of 3 applications with Propineb per year is allowed, leftovers may be used up until 22 June 2019.
Thiram	Pomarsol 80 WG,	4	250 g	3 kg	35	A maximum of 4 applications with Thiram per year is allowed, leftovers may be used up until 30 April 2019. A maximum of 5 applications with Dithiocarbamates per year is allowed.
	Silfur WG,	4	250 g	3 kg	35	
	Tetrasol 80,	4	250 g	3 kg	35	
	Tetrasol liquido,	4	400 ml	4,8 l	35	
	TMTD 50 SC	4	400 ml	4,8 l	35	
Dodine	Syllit 544 SC, Syllit 65	2	85 ml	1,25 l	28	A maximum of 3 applications per year is allowed.
		2	120 g	1,38 kg	40	
Fluazinam	Banjo, Nando Maxi, Ohayo	3	100 ml	1 l	60	A maximum of 4 applications per year is allowed.
		4	100 ml	1,5 l	63	
		1	100 ml	1 l	60	
Fludioxonil	Geoxe	2	30 g	0,45 kg	3	A maximum of 2 applications per year is allowed.
Fosetyl-Aluminium	Alette, Alisystem, Arpel WDG, Elios WG, Fosim, Jupiter WG, Kelly WG, Maestro WG Advance Optix WG	-	250 g	3,75 kg	28	
		6	150 g	1,8 kg	40	
		6	150 g	1,8 kg	40	
		-	250 g	3,75 kg	28	
		3	300 g	-	15	
		6	150 g	1,8 kg	40	
		6	150 g	1,8 kg	40	
		3	300 g	-	15	
-	250 g	3,75 kg	28			
Laminarin	Vacciplant	-	-	1 l	0	
Lime sulphur	Polisolfuro di Calcio Polisenio	-	2000 g	24 kg	30	
Meptyldinocap	Karathane Star	2	60 ml	0,6 l	Start blossom	A maximum of 2 applications per year is allowed, only from mouse-ear stage to the begin of blossom.
Potassium hydrogen carbonate	Armicarb 85, Karma 85, Vitikappa	5	-	5 kg	1	
		5	-	5 kg	1	
		6	500 g	7,5 kg	0	
Potassium phosphonates	Century Pro	6	-	1,9 l	35	A maximum of 6 applications per year is allowed.
Quinoxifen	Arius	2	30 ml	-	14	A maximum of 2 applications per year is allowed, leftovers may be used up within 2019.

<u>Sterol biosynthesis inhibitors (SBI):</u>						
Difenoconazol	Agridif 250,	4	15 ml	-	14	A maximum of 6 applications with sterol biosynthesis inhibitors per year is allowed, additionally 2 further applications with Difenoconazol against scab are allowed. A maximum of 2 applications with Myclobutanil per year is allowed. For each of the remaining active ingredients a maximum of 4 applications per year is allowed.
	Difcor 250,	4	15 ml	-	14	
	Difference,	4	15 ml	-	14	
	Driscoll,	4	15 ml	-	14	
	Score 10 WG,	4	37,5 g	0,75 kg	14	
	Score 25 EC,	4	15 ml	0,3 l	14	
	Sponsor	4	15 ml	0,3 l	14	
Myclobutanil	Duokar 2,5 EW,	2	220 ml	3,3 l	14	
	Systhane 2,5 Plus	2	220 ml	3,3 l	14	
Penconazol	Douro 10 WG,	4	45 g	-	14	
	Noidio Gold,	4	90 g	-	14	
	Noidio Gold 10 EC,	4	45 ml	-	14	
	Pencor 10 EC,	4	45 ml	-	14	
	Pykos,	4	50 g	-	14	
	Scudex,	4	50 ml	-	14	
	Topas 10 EC,	3	30 ml	0,5 l	14	
	Topas 2,5 WG,	3	130g	2 kg	14	
	Topas 200 EW,	3	16 ml	0,25 l	14	
	Topas 33 SC,	3	100 ml	1,5 l	14	
	Visir Pencotech	4	50 ml	-	14	
Tetraconazol	Concorde 40 EW,	3	50 ml	0,75 l	14	
	Domark 125,	4	30 ml	0,3 l	14	
	Emerald 40 EW,	3	50 ml	0,75 l	14	
	Lidal	3	50 ml	0,75 l	14	
<u>Strobilurins</u>						
Pyraclostrobin	Cabrio EC	3	-	0,4 l	21	A maximum of 3 applications with Strobilurins per year is allowed.
Trifloxystrobin	Flint	3	15 g	0,225 kg	14	
<u>Sulphur</u>						
	Crittovit WG,	-	500 g	-	5	
	Heliosoufre S,	-	-	7 l	3	
	Kumuluf Tecno,	10	-	6 kg	5	
	Microbagnabile 80,	-	400 g	-	5	
	Microbagnabile WG,	-	300 g	-	5	
	Microsulf 90,	-	300 g	-	5	
	Microsulf WG,	-	300 g	-	5	
	Microthiol Disperss,	-	500 g	-	5	
	Primisol 80 wdg,	-	400 g	-	5	
	Sulfur 80 WG,	-	500 g	-	5	
	Thiamon 80 Plus,	-	500 g	-	5	
	Thiopron,	-	-	9 l	0	
	Thiovit,	-	600 g	9 kg	0	
	Tioflor WDG,	-	600 g	-	5	
	Tiogel 80 WDG,	-	500 g	-	5	
	Tiogold Disperss,	-	500 g	-	5	
	Tiolene,	-	-	4 l	5	
	Tiolene 80 WG,	-	500 g	-	5	
	Tiosol 80 WG,	-	600 g	-	5	
	Tiospor WG,	-	500 g	-	5	
	Tiovit Jet,	-	600 g	9 kg	0	
	Tiowetting DF,	-	500 g	-	5	
	Zolfo flow MCT	-	450 ml	-	5	
	Zolvis 80 Sector,	-	600 g	-	5	
	Zolvis 80 WDG	10	-	6 kg	5	

**HERBICIDES**

Active ingredient	Trade name	Max. applic. per year	Maximum dosage per ha and year	Waiting period (in days)	Remarks
Carfentrazon ethyl	Affinity Plus,	-	1 l	7	
	Spotlight Plus	-	1 l	7	
Glyphosate	Buggy TF,	-	9 l	7	
	Clinic ST,	-	9 l	0	
	Glifosar Flash,	-	9 l	0	
	Glyfos Pro,	-	7,2 l	0	
	Glyfos Ultra,	-	9 l	0	
	Hopper 480,	-	7 l	0	
	Pantox Max,	-	6,6 l	0	
	Roundup 450 Plus,	-	7,2 l	7	
	Roundup Bioflow,	-	9 l	7	
	Roundup Platinum,	3	6,75 l	7	
	Roundup Power 2.0,	3	9 l	7	
	Seccherba Respect,	-	9 l	0	
	Taifun MK CL,	-	9 l	0	
Touchdown	-	8 l	0		
MCPA	Erbitox M Pro,	1	0,84 l	80	
	Fenoxilene 200,	1	2,1 l	80	
	Mistral,	1	2,1 l	80	
	Regran Extra,	1	0,84 l	80	
	U46 M Star	1	0,84 l	80	
Oxadiazon	Ronstar FL	-	4 l	0	Only in the first 3 years after planting
Oxyfluorfen	Dribbling 240 EC,	1	0,625 l	0	The use is allowed only between the last decade of September and the first decade of May.
	Hereu,	1	0,625 l	0	
	Mannix,	1	0,625 l	0	
	Oxyfluor	1	0,6 l	0	

**OTHER PRODUCTS**

Active ingredient	Trade name	Max. applic. per year	Maximum dosage		Waiting period (in days)	Remarks
			per hl	per ha		
Acibenzolar-S-methyl	Bion 50 WG	6	15 g	0,2 kg	7	A maximum of 6 applications per year is allowed.
Alpha-Naphtyl-Acetamid (NAD)	Amid Thin W,	-	120 g	-	30	
	Diradone,	-	20 g	0,4 kg	30	
	Geramid-Neu	-	200 ml	-	30	
Alpha-Naphtyl-Essigsäure (NAA)	Dirager,	-	40 ml	0,4 l	7	
	Fitop 80,	-	50 ml	-	7	
	Fixormon,	-	30 ml	-	7	
	Hergon L,	-	75 ml	1,125 l	7	
	Nokad,	-	100 ml	-	7	
	Obsthormon 24a	-	30 ml	0,3 l	7	
6-Benziladenin	Agrimix TOP,	-	100 ml	-	0	
	Braitex Pro,	-	100 ml	-	0	
	Brancher Dirado,	-	100 ml	-	0	
	Cylex Plus,	1	750 ml	-	90	
	Exilis,	-	1000 ml	10 l	0	
	GerBA 4 LG,	-	500 ml	5 l	0	
	GerBAthin 2 LG,	-	1000 ml	10 l	0	
	MaxCel,	1	750 ml	-	90	
	Separo	-	100 ml	-	0	

6-Benziladenin + Gibberelline (A4 + A7)	Agrimix PRO,	-	90 ml	0,9 l	0	Only apples
	Perlan,	-	100 ml	-	0	
	Plis,	-	90 ml	0,9 l	0	
	Profile,	-	100 ml	-	0	
	Profile Plus,	-	100 ml	-	0	
	Progerbalin LG,	-	100 ml	-	0	
	Promalin NT, Prorex	-	100 ml	-	0	
Ethephon	Ethrel,	2	40 ml	0,6 l	14	1 treatment with a maximum of 0.6 l/ha or 2 treatments with a maximum each of 0.375 l/ha of Ethephon are allowed, only until 15 June, only on apples.
	Gerephon SL	2	40 ml	0,6 l	14	
Gibberelline (A4 + A7)	Agrimix GOLD,	-	130 ml	1,3 l	0	Only apples
	Gerlagib LG,	-	130 ml	-	0	
	Gibb Plus,	-	130 ml	1,3 l	0	
	Nectar,	-	30 ml	0,45 l	0	
	Nectar Plus,	-	60 ml	0,9 l	0	
	Novagib, Regulex 10 SG	-	60 ml	0,9 l	0	
1-MCP	SmartFresh	3	-	-	0	A maximum of 3 applications per lot is allowed, it should not be used for the variety Braeburn.
Metamitron	Brevis	2	-	2,2 kg/ application 4,4 kg/year	60	A maximum of 2 applications per year is allowed.
Prohexadion-Ca	Regalis Plus	-	-	2,5 kg/ application 3 kg/year	0	
Sheep fat	Trico	-	-	20 l	0	

### **WETTING AGENTS (EXAMPLES)**

Active ingredient	Trade name	Max. applic. per year	Maximum dosage		Waiting period (in days)	Remarks
			per hl	per ha		
Isodecylalcohol ethoxylate	Bagnante Cifo,	-	100 ml	1 l	0	
	Vector	-	100 ml	1 l	0	
Pinolene	Nu-Film-P	-	-	0,4 l	0	
Sorbitan monooleate	Bagnante Sariaf	-	150 ml	1 l	0	

## Fertilizer index

The fertilizer listed in the following index may be used in integrated production. The updated list is published on the AGRIOS website [www.agrios.it](http://www.agrios.it).

Acadian	Axifert Universal
Acti-Mang 600	Axifito MnZn
Actiflow B	Azocor 105
Actiflow B 2.0	Azofol
Actiflow Ca560	Azolon Fluid 28
Actiflow MgO500	Azos 300
Actiflow Mn500	
Actiflow Mn560	Baseos Liq Endo
Actiflow Zn 680F	Basfoliar Force SL
Actinet	Basfoliar Kelp BIO SL
Actisel	Basfoliar Plantae Bio SL
Adimel+ Gold	Basic NPK 4-7-19
Adivel neutro	Belfrutto MB
AG-Life	Betabio active
Agrifol P.S. 20-20-20	Bio 20
Agriplant 1 20-5-10 (+2)	Bio Aksxter M31
Agriplant 20-20-20	Bio Energy
Agro N fluid	Bio Energy Veg
AgroCyprum	BioAgenasol
AgroFerrum	BioCure
Agrofert MB	Biofol Suspension 2
Agroleaf Power Total 20-20-20	Bioforge
Agrolution pHLow 10-50-10	Biogas slurry
Agrolution Special 13-5-28	BioGesso
Agrolution Special 14-7-14	Biokalium
Agrolution Special 14-8-22	Biokalium 338
Agromag 9 L Complex	Biomit
Agroman 9 L Complex	Biopromoter Ev 3-9
Agromaster 15-7-15	Biosol
Agromol	Biostimolante Alga Special
Agrozin 9 L Complex	Biotrissol 6-5-5
Aleado 96	Bioup FL
Alex PK	BitterMag
Alexin 95 PS	Biuron
Alfaplus	BIWI
Alga Ca	Blackjak bio
Algacifo 3000	Blattab
Algaenergy	Blaukorn Classic
Algatonic	Blaukorn Premium
AlgiCal	Blok 5
Algonia	BM 86 AA
Alical	Bolikel XP
Amminoalg Bio+	Bor PK 17
Ammonium Nitrate	Borato di calcio CL
Amnitra	Bork 37
Apfel Energy	Boro 6 Ca LG
Arpa SOP – Solfato di Potassio	Boro KB 19
ATS	Bortrac 100 FL
ATS Kristall 90/20	Botryfun Gold
ATS L. (Blütenselekt)	Butterfill Ca Mg
ATS Top 15	Butterfill S 33
Avantgarde	
Axical	Calbit C
Axifert 20 NV	Calce agricola viva – Branntkalk gemahlen
Axifert Final	Calce agricola viva – Branntkalk körnig
Axifert Start	Calcikorn GS

Calcio Bio	Dix Bio
Calcioenergy	Dolokorn
Calciomix	Dolokorn 90
Calciprill (Algenkalk)	Dolophos 15
Calcisan Green	Dolophos 26
Calcisol HQ	Dünger 20
Calcisol Plus	
Calcium Tiller	Easyfer
Calcypit	Ecoferro 250 Plus
Calibra	Ecolenergy Apfel
Calitech	Eisenchelat 6%
Calsol	Ekokel Cu
Caltrac 560 Plus	Ekokel Man
Capfol	Ekokel Zin
Carbonato di calcio – Kohlesaurer Düngekalk	EKOprop
Carrier Mn	EKOprop NX
Carrier Zn	Elfo
Cattle manure	EnerGemma
Cell out	Entec 26
Cerbero NPK 15.5.30	Entec perfect 14-7-17
Cerbero NPK 20.20.20	Entec solub 21
Cereaphos 40	Epso Top
Cet 46 Green	Eptasol
Chelal 3	Esamix Mg
Chelal Cu	Essemax
Chelal Fe	Esta Kieserit fein
Chelal Mn	Esta Kieserit granuliert
Chelal Noor	Euroactiv Agro
Chelal Zn	Euroalg S
Chelene	Eurofert Special
Cheram	Europlus
Cifo KS 64	Evohl
Citocalcium	Expando
Citoveg Radicale	Extractiv
Citra Grow	
Click Horto	F1
Clorcal Plus	F1 (furos twin)
Cloruro di calcio CL	F2
Complex Blu NPK 12.12.17	F3
Complex Fruttorto 9.6.18	Farben H 50
Complex Gray 5.8.18+2	Ferfast
Concime NPK (MgO-SO <sub>3</sub> ) 12-6-18 (4-17)	Ferri-Chel 100
Concime NPK (MgO) 13.10.12 (3)	Ferri+plus 50
Concime NPK 20.10.10	Ferrilene Trium
Condor	Ferronove
Copper Kela 15 Cu	Ferropiù-Mg
CreScal Boron	Ferrostrene Premium
CreScal Fe-SA	Fertigofol Bio
CRF 900	Fertigonia 10-40-10
Crystalfer	Fertigonia 10-5-35
Cynoyl Z Special	Fertigonia 16-8-24
Cytomax	Fertigonia 18-18-18
	Fertigonia 20-20-20
	Fertigonia 25-10-10
DC 44	Fertildung Stallatico
DC Borstart	Fertilpollina
DC Frucht	Fertilvegetal
Decco Green Protege	Fertiprotec
Decco Shield	Ferysol Top 31
Defense	Fidelius FL
Dentamet	Fill 25-20-15 FC
Dirasol 65S	

Dix 10N Bio	Haifa MAP
Fill 26-6-18+M	Haifa MKP
FiloCal Calcium	Haifa NIT
FiloCal Foliar Feed	Haifa ProteK
Final K	Haifa SOP
Fito-PK	Haifa SOP Bio
Fito-PK Crystal	Hakaphos Naranja 15-5-30
Fitomax-gold	Hascon 12
Fitostim Alga	Hascon M10 AD
Floral 20.20.20	Hendosar
Floral K	Hersbrucker Gesteinsmehl
Florilege Ultra	Hi-Q Melo
Floristar	Hold Plus
Flow shade	Hortisul
Fluisol organico	Hortyflor
Folanx Ca 29	Humic Super
Foliastop Bio	Humifirst sl
Folical	Humilig 8/8
Folicist	Humipromoter
Foliflo BCa	Hydrofert 15-30-15+2MgO
Foliflo Excellent	Hydromag 500
Foliflo Mg	Hyperkorn 026
Foliflo Mn	
Foliflo Zn	Idrofeed 18.11.27
Folistar Cu	Idrofeed 30.5.10
Folur	Idrofloral 15.10.30
Fosblend	Idrofloral 20.20.20
Fosfid'or	Idrofloral 35.5.8
Fosfisan	Idrofloral 8.5.44
Frubell	Idrol-Veg
Fructol NF	Ilac-on
Fruit Max	Ilverde
Fruwachs Mg	Impulsiv Premium
Fuego	INO Cal 250
Fulet	INO Flow Mg 500
Fulvin	INO Flow Mn 500
Furiak	INO Flow Zn 680 F
Furiak Plus	INO Green-NMg
FytoFert PK	INO Soufre-N
FytoFert S	Ionifoss
	IronGlep 7 WPG
Gen Rame	Italpollina
Geo-Live	
GER-ATS LG	Jafgreen Frutti
Gerfos K	
Gold Dry	K-Bomber 56
Gorfrut	K-express ZF
Green Power	K-Force
Greenmix	K-Leaf
Greit VG	K&A Colorado
Grow More 12-48-8	K&A Decide
Grow More 19-19-19	K&A Evidence
Grow More 20-20-20	K&A Evidence 2.0
Grow More 30-10-10	K&A Fort-Soil
Grow More 4-10-46	K&A Frontiere
Grow More 9-15-30	K&A sil-ka
Grumifol	K&A Urikane Flash
	K&A Vitalumi
Haifa Cal	Kalex
Haifa DKP	Kalidos LG
Haifa MAG	Linzer L.A.T. Complex (14-10-20)

Kalisop fein	Linzer L.A.T. Complex (15-15-15)
Kalisop gran.	Linzer NAC 27 N
Kalkkorn	Liquid manure
Kally 27	Lower 7
Kamab 26	Lysodin Veg
KAN 27 Granulare	
Kappa G	Macht SF
Kappa V	Macys BC 28
Keeper	Madeira NPK 5-5-12
Keliron Top	Maganit
Kiraly Fe 2,5 G	Magasul
Kohlensaurer Magnesiumkalk 95	Magnesio solfato LG
Kriphther	Magnesiogreen Attivato Bio
Krista K	Magnesium 16 PG
Krista MAG	Magnesium DS Special
Krista MAP	Magnisal
Krista MgS	Magnital
Krista MKP	Magphos
Kristalon Arancione	MAGyK ZM
Kristalon Azur Special	Maior 0-42-50
Kristalon Bianco	Maior plus
Kristalon Blue	Mangan 10 LG S
Kristalon Blue Label	Mangan 32 PG
Kristalon Lilla	Manganese 134
Kristalon Rosso	Manna Horngrieß
Kristalon Speciale	Manna Lin A
Kytos LG	Manna Lin B
	Manna Lin K
Labifol Movical	Manna Lin M
Labifol Resulta 18-16-18	Mannafert V
Labifol Spydone	Manni-Plex Ca
Labifol Sugar-K	Manni-Plex Multi Mix
Labimancin	Mantrac Pro
Labin 10-10-40	MAP Arpa Speciali 12-61
Labin 18-18-18	MAP solub
Labin Materia Organica 84%	Maxflow Ca
Landamine Cu	Maxflow Mn
Landamine Zn	Maxflow Zn
Last N	Maxi Plex TF
Leaf-Fall	Maxical
Lebosol Ferro Citrato	Maxifrutto
Lebosol Kalium 450	Maxilife
Lebosol Magnesium 400 SC	Mazinca 140
Lebosol MagSoft SC	MC Cream
Lebosol Manganese 500 SC	MC Extra
Lebosol Zinco 700 SC	Megafof
Lebosol-Eisen-Citrat GOLD	Metalosate Multimineral
Lebosol-FruitMix	Micotric L
Lebosol-HeptaEisen	Microspeed 130
Lebosol-HeptaKupfer	Microweed Calcio
Lebosol-HeptaMangan	Microweed Ferro
Lebosol-HeptaZink	Microweed Magnesio
Lebosol-Silizium	Microweed Manganese
LG 81	Microweed Zinco
Libamin Mix	Microzin
Lieta-veg	Minus Calcio
Ligoplex Ca	Minus Ferro
Ligoplex Mg	Minus Magnesio
Linzer Complex 15/5/18	Minus Multi
Linzer Complex 20/20	Minus Rame
Linzer L.A.T. Complex (12-12-17)	MKP Arpa Speciali 0-52-34



Molex	Nutristart
Molybdenum fast	Nutriter vigneto e frutteto
Multi-K GG	
Multi-K Prills	Oasi Gel
Multi-Max	Obstkorn Blau 12-12-17
MycoUp	Obstkorn Plus 15-5-20
Myr Potassio	Obstkorn Super 20-5-10
Myster Vegetale	OmyaPro Calcium
	Optycal
Natural Force	Organagro
Nature	Orosoil
Naturgrena	Oscorna Horngrieß
Naturgrena Life	Oscorna Hornspäne
Naturgrena Plus	
Nectar Intense	Patentkali
NEM 2 (furos twin)	Perfosfato semplice
Neobit New	Perfosfato triplo
Neutral	Perlka Kalkstickstoff
Nevio	Pharmamin M
Newcal	Phenix
Nippon NK 13-46 cristallino	Phos 60 EU
Nippon NK 13-46 granulare	Phos-Phik 0-30-20
Nitracid	Phosfik Ca
Nitrophoska Perfect	Phosfik PK
Nitrophoska Spezial	Phosfo PK
Nitrophoska super	Phoska-Max 30-20
Nov@	Phosphonia
Nov@ GR	Phostrade Ca
Nova Calcium	Phostrade Mg
Nova Ferti-K	Phostrade Zn
Nova MagPhos	Phylgreen
Nova N-K	Phylgreen Kuma
Nova Peak	Phytofert
Nova PeKacid	PhytoGreen-Calciumborate
Nova Potassium	PhytoGreen-CalciumCarboxylate
Nova SOP	PhytoGreen-Mg500
NovaTec Classic 12-8-16	PhytoGreen-Mn27
NovaTec Nitroriz 32 (+32)	Phytos 50
NovaTec Premium 15-3-20	Phytos PK
NovaTec Solub 21	Pical-Max
NPK 12-12-12	Pig manure
NPK Original Gold	Plantafol 20.20.20
NPK Performance 5-7-14	Plantafol 5.15.45
NPK Performance 9-7-14	Plantflor 400
Nutex Mag Plus	Pollinamatura
Nutrakil	Poly-feed 11-42-11
Nutricomplex 18-18-18	Poly-feed 12-18-27
Nutricomplex 20-20-20	Poly-feed 14-7-28
Nutricomplex 8-24-24	Poly-feed 15-5-30
Nutricomplex Arancio 7-12-40	Poly-feed 16-6-31
Nutricomplex Azzurro 13-40-13	Poly-feed 18-18-18
Nutricomplex Bianco 15-10-15	Poly-feed 19-9-19
Nutricomplex Citrus & Fruits	Poly-feed 20-20-20
Nutricomplex Rosso 15-5-30	Poly-feed 26-10-16
Nutricomplex Verde 23-6-6	Poly-feed Drip 14-7-21
Nutrisan 12.20.30	Poly-feed Drip 26-12-12
Nutrisan 14.40.12	Poni cristallino
Nutrisan 20.20.20	Poni granulare
Nutrisan 20.5.30	Pratiko 21
Nutrisan 27.15.14	Prodigy Plus
Nutrisan special	ProLiq Calcium LQ

Qrop K Plus	Pushy
Qualical 250	Supremo W 10-50-10
	Supremo W 15-5-30
RA.AN 13156	Supremo W 20-20-20
Rame Zolfo Plus	Supremo W 8-17-41
Red	Systemag SL
Red Radicali	
Red Skin LG	Tayson
Rewind	Terra Mater Humuslana
Rexolin Q48	TerraMadre
Rheobor FL	TerraSana
Rumisan Stabilized	Tifi
Rust-Ger	Topstim 66
	Tradecitrus
Seaweed Grow PK 15-32	Tradecorp AZ Jaguar
Seaweed Mix	Tradecorp AZ Mix
Seniphos	Tradecorp Cu
Sequestrene Life	Tradecorp Fe
Sequestrene NK 138 Fe	Tradecorp Mn
Sequifill 6.0T SS	Tradecorp Zn
ShutCrop L	Tradefer
SIC Phoska	Trafos AZ
Siveg GR	Trafos Cu
Slurry	Trafos K
Soil Pro	Trafos Zn-Mn
Solar Calcium nitrate	Trainer
Solar MAP	Tribù NPK 3-3-3
Solar Potassium nitrate	Turbo Plant
Solfato Ammonico	
Solfato Ammonico – Petrokemija	Ultraferro
Solfato Ammonico Arpa	Ultrasol 11.42.11+2MgO+TE
Solfato di potassio 50	Ultrasol 12.18.27+2MgO+TE
Solinure FX 13-40-13	Ultrasol 13.5.30+2MgO+TE
Solinure FX 18-9-18	Ultrasol 18.18.18+2MgO+TE
Solinure GT 20-20-20	Ultrasol 24.6.12+2MgO+TE
Solupotasse	Ultrasol K Plus
Sonar 7-15	UniKo 25,5
SOP solub	Unimar
Spray Plus	Uniphos K
Sprühdünger Tipo 26	UnIron Plus
Sprühdünger Tipo 27	Unisol 10-40-10+2
Sprühdünger Tipo 5	Unisol 15-5-30+2
Starblend 12.36.12+2MgO	Unisol 20-20-20
Starblend 12.6.21+5MgO	Unisol 24-6-12+2
Starblend 18.18.18	Unisol 8-12-38+2
Starblend 22.5.10+4MgO	UniZim
Starsoil	Urea 46 – Petrokemija
Steric K DS	Urea 46 N Lat
Steric P DS	Urea prilled
StickUp Demetra	Urea Rumimax
Stimulante Plus	Urea Rumisan
Stopit	
Sugared	Vegafoil
Sunred	Vegand
Super Humus	Vera Pollina
Superbios liquido	Vignafut MB
SuperCalibro	VitaMel – Bio
Superstallatico	Vitanica Si
Supremo L 101 B+Ca	Volldünger micro N.
Supremo L 262 Mn+N	Vulcano
Welgro Potasio	

Welgro Standard Plus  
Welgro T.20+Micro  
Wuxal Aminocal (pflanzlich)  
Wuxal Calcium Suspension  
Wuxal Combi Mg  
Wuxal K 40  
Wuxal Manganese  
Wuxal P 5-20-5  
Wuxal Super

YaraBela Extran 33,5  
YaraLiva Calcinit

Welgro Mar  
YaraLiva Tropicote  
YaraMila Grower  
YaraMila Partner  
YaraMila Power  
YaraVita Coptrel 500

Zinc 10 LG S  
Zinc fast  
Zinco 134  
Zintrac 700  
Zn-Golden-Biotrissol  
Zolferro Energy

### **Plant strengthener**

Caolino Bitossi BPLN  
Olio Vegetale Supercote Technology  
Polvere di roccia (BioKimia)  
Polvere di roccia (Sala)

Propolis (Sunchemical)  
Terios Liquido  
Terios Top  
Zeolite Micronizzata Bitossi

## Ecological measures



**At least two of the items** chosen from this list must be realized in each **year of cultivation**. The points effected must be recorded in the orchards register.

### **Ecological compensations areas and care of the orchard environment:**

- In at least one production area, there is a pond with a minimum area of 50 m<sup>2</sup>.
- In at least one production area, there is a standard-sized tree.

### **Choice of cultivar and planting system:**

- The farm includes an orchard with a fungus resistant variety.
- Single row planting is chosen at the time of planting.

### **Fertilization and soil management:**

- Nitrogen fertilization is effected after N-min tests (analysis must be enclosed).
- Early leaf analysis is effected in the orchard.
- At least in one orchard the tree strip is kept green the whole season and/or is kept free of grass using alternative methods without herbicides.

### **Irrigation**

- Control of soil moisture is effected using a tensiometer or other device for measuring soil moisture.
- In at least one production area, drip technology satisfies the water requirements.

### **Biological or biotechnical defense mechanisms:**

- Orchards in the zone infested by May bugs are covered by ground nets.
- Mating disruption is used against codling moth, oriental fruit moth, tortrix moth and leopard moth.
- Juice traps are used to fight clear wing borers.
- Nesting boxes are set up in the orchard to attract titmice.
- In at least one production area, perches for raptors were constructed.
- Hiding places for weasels, hedgehogs, shrews or grass snakes are created in the orchard (rock piles, pipes, stick piles).
- Predatory mites are introduced into at least one orchard.
- Shoots infected with mildew or aphids are removed.

### **Pest control:**

- Pheromone traps are placed and the moth catches are regularly registered.

### **Drift reduction:**

- In order to reduce the drift to neighboring property, a hedge was planted.
- For drift reduction, spraying equipment with a blower attachment and injector flat jet nozzles on all nozzle positions is used.

### **Mechanical blossom thinning:**

- A mechanical blossom thinner has been used for thinning.