Flevo Berry

FLORICE

GENERAL VARIETY INFORMATION & CULTIVATION MANUAL

Contents

1. General Variety Information

Florice (breeder's reference 13-115-12) is an everbearing strawberry variety developed by Flevo Berry. The variety is as one of the most stable everbearing varieties in our assortment. It distinguishes itself by large fruits with a distinctive shape, excellent flavor and high tolerance to powdery mildew and root diseases. The name Florice is derived from the Latin word for "flourishing, thriving".

Plant Characteristics

- Uniform, homogeneous crop
- Open plant structure
- Healthy dark green foliage
- Strong flower and leaf stems
- Flower trusses protrude well through the foliage
- High resistance to powdery mildew and root diseases
- Average of 4-5 large flowers per truss

Fruit Characteristics

- Short-conical fruit shape
- Large berries (average >20 grams/fruit)
- Intense red color with light red shoulders
- Excellent flavor and high brix value (>9° under good conditions)
- Firm fruit skin, not sensitive to bruising and pressure marks
- Fruit color, gloss and fresh calyx are well preserved during storage
- Excellent shelf life and transportability

Production

- Above average productivity (>1.5 kg/plant)
- High percentage of Class I (85-95%)
- Consistent yield with the right plant balance
- First flush relatively early (comparable to Clery)
- Fruit size maintains throughout the season
- High picking performance

Florice is suitable for various cultivation types and strategies, which are further discussed in the cultivation manual.

2. Cultivation Manual

Florice has proven itself in various situations. Despite not having very specific needs, there is also not a one size fits all approach for the variety. Each cultivation with Florice is different and requires its own strategy. Take our recommendations at heart but don't forget to consult your crop advisor for tailored advice for your situation.

2.1 General

Florice is a "high-chill" everbearer that produces new flowers under both short and long days. This type of variety is also called day-neutral, although that is not entirely accurate as day length and average daily temperature will influence the degree of flower initiation.

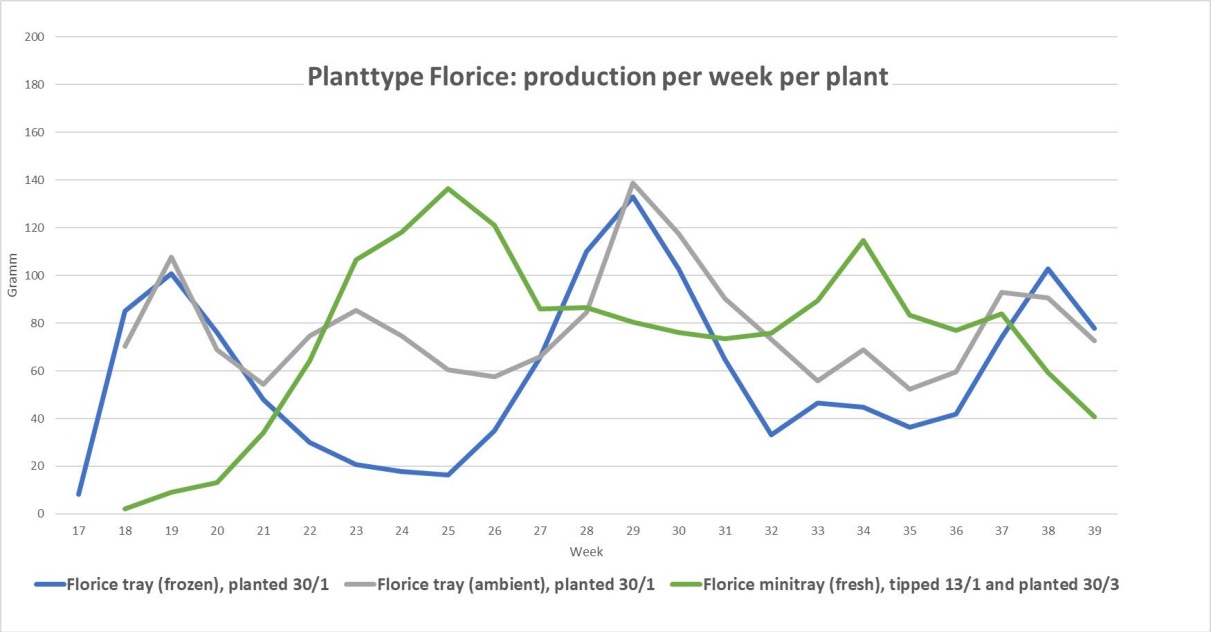
The table below shows the relationship between day length and daily temperature on flower initiation:

Daily temperature	**<10° Celsius**	**15-21° Celsius**	**>25 ° Celsius**
Short day <14 hrs	Low	Average	Low
Long day >14 hrs	Low	Maximum	Average

Under very low (<5°C) or high (>30°C) temperatures, flower initiation is minimal. This process strongly influences the harvest profile.

The number of chill hours is also important. Starting with cold store plants, Florice often shows the typical everbearer harvest profile (e.g. like Favori). However, the profile can be well steered by starting with the right plant material.

When the planting material has formed many flower buds before cold storage, Florice usually starts quite generative, followed by a harvest dip (vegetative phase) in which the plant recovers. However, by spreading out the development of the flower trusses, this dip can be greatly limited. For the steadiest production pattern, it is wise to start with a plant with limited chill hours and sufficient spread in flower trusses.



The graph shows Florice's strong response to chill hours. In the graph the results of a substrate cultivation in an unheated greenhouse with three plant types are presented: a cold store, ambient and fresh (mini)trayplant.

The ambient (overwintered) plant with fewer chill hours and the fresh minitrayplant without chill hours show a more even harvest pattern. However, these are more sensitive to cold during the start. If temperature cannot be regulated, these plant types are often not suitable for early season planting. Chilled plants are less sensitive from this perspective. In addition, they can be stored longer and delivered over a longer period. They stretch easily and often have a larger first flush depending on the number of trusses formed before cold storage.

2.2 Harvest Spread

From a sales perspective but also to mitigate risks, it may be desirable not to plant the entire farm at once with one plant type. This can be achieved by:

- Planting different plant types at the same time
- Planting different plant types at different times
- Planting the same plant type at different times

The variation in planting times and types usually flattens the harvest quantity at the farm level. To best match the planting dates of the different plant types with the desired harvest forecast, it is important to know the plant material's history.

Knowledge about the Growing Degree Hours (GDH) accumulated during propagation, top flower height and plant structure are very useful when making a cultivation plan. However, your success often depends on the weather after planting. We advise using multi-year average daily temperatures, calculated from the planting date of a production field to have the soundest basis when planning.

From Flower Initiation to Harvest (GDH Model)

Using the Growing Degree Hours (GDH) formula can be very helpful in making accurate crop, labor and harvest planning. Broadly speaking, a Florice crop requires around 27,500 GDH from flower initiation until the first ripe fruits.

Initiation usually does not start immediately after cutting tips or planting. Once tips are planted flower initiation starts quickly after rooting. When planting a fully rooted plant which received chill hours the flower initiation can take up 3 to 6 weeks before starting again.

The GDH requirement differs per variety and is determined through cultivation experience. The required GDH is an indication with a margin of +/-10%. It is not only determined by air temperature, but also to factors such as soil temperature, day length and stress. The required GDH applies to each formed flower and is reached earlier at high than at low temperatures.

To calculate the Growing Degree Hours:

1. *Start from the date flower initiation began. This date can be determined retroactively after the first flower bud examination.*
2. *The best time for examination depends on when the plants were cut or planted.*
3. *From initiation start, calculate the average hourly temperature minus 4.5°C. This number is the GDH for that hour.*

For example, if the average temperature on April 20 between 8:00-9:00 was 11°C, the GDH for that hour is 11 - 4.5 = 6.5 GDH.

We experienced that Florice is comparable to Favori in terms of required GDHs. A Florice fruit needs around 27,500 GDH from initiation to harvest, with a +/-10% margin, under good growing conditions. This means that split to the different cultivation phases it will take 12,500 GDH from initiation to a top flower height of 8-10 mm, another 7,500 GDH from this height to flowering and approximately 7,500 GDH from first flowering to first ripe fruit. Other varieties may require up to 10,000 GDH in this final phase.

In everbearers, initiation never happens at the same time, even within the same batch of plants. The age (generation) of the tips plays a role. Using same generation tips will result in more uniform initiation than using mixed generations. The same irregularity occurs when using frigo plants from a propagation field, where different generations usually end up in the same crate.

If cultivation starts in a warm period or environment, the period of non-receptiveness will be slightly shorter. Flower bud research can provide clarity about the actual start date of initiation. Besides the period of non-receptiveness due to accumulated chill hours, the plant load from many flowers and fruits can also postpone the development of new flower buds.

2.3 Plant Types

Florice is available in different plant types. Not all plant types are suitable for every cultivation strategy. Choose a plant type that fits with your cultivation goal and technique.

In general, the following aspects need to be taken into account:

- Open field or substrate cultivation
- Uncovered or protected cultivation, distinguishing between rain cover, tunnel or greenhouse
- An even harvest pattern or a desired harvest peak
- Intended planting period, e.g. a cool spring or hot summer
- Desired harvest period, e.g. as early as possible or counter-cyclical

By choosing different varieties, plant types and moments, the harvest can be spread out. It is important that each individual cultivation can be steered separately. The most used plant types are:

***Bare root plant A**:* Grown in an open field, rhizome diameter of about 12-15 mm. Each plant has 1 crown and 1-2 flower trusses. This is the most common type for open field cultivation.

Bare root plant A+: Also grown in an open field. The rhizome diameter is usually 15-18 mm. The plant usually has 1 or more crowns with 2-3 flower trusses in it. This type can be used for both open field and early spring planted substrate cultivation, provided growing conditions are good from the start.

Fresh plug plant (85cc): In early July, a fresh tip is planted in a plug and takes approximately 6 to 7 weeks to grow into a well rooted plant. This type is particularly suitable for open field cultivation with overwintering in a tunnel, for a large harvest peak in May.

Cold store mini-tray plant (135cc): From mid-July to early August the tips for the mini-tray are harvested. In general, during fall it develops into a plant with 2 crowns and about 4 trusses. After planting in early spring it stretches easily and will have a modest first flush.

Cold store tray plant (230cc): From early to late July the tips for a tray plant are cut. By late November/early December a well-developed plant has on average 2-3 crowns with at least 4-6 trusses. Like the cold store mini-tray plant it easily starts to grow in spring, but it has a much larger first flush. Unlike Favori, Florice suffers less from a large dip after the first flush in case a heavy trayplant (with multiple flower trusses) is used. Florice tends to spread flowering over a longer period and is also capable of pushing out the most juvenile flower trusses that were produced late autumn.

Ambient tray plant (230cc): Overwintered in a greenhouse, made from hanging tips cut early to late July. Generally it develops into a plant with 2-3 crowns and 4-6 trusses. Kept frost-free in winter, preferably a few degrees above zero. New flowers appear faster than with a cold store tray plant. Depending on the number of chill hours, the harvest dip will be minimal. Benefits include a more even harvest pattern, slightly larger fruit size due to a better balance balance, and less crop maintenance.

Fresh mini-tray plant (135cc): Usually around July 1 the tips are cut and after approximately 45 days a fresh plant is ready for planting. Planting in a greenhouse takes place around August 20. These plants are suitable for winter cultivation under assimilation lighting. If growing conditions are well regulated (sufficient light and temperature) Florice can be grown with hardly a harvest dip. Like an ambient tray plant, there is a positive effect on average fruit size and crop maintenance. To a limited extent fresh mini-tray plants are also available during other periods.

Timely inform your propagator about your specific needs. Aspect like tipping date, amount crowns and trusses per plant, fertigation scheme, amount of chill hours can have an enormous impact on the

success of your crop. On the Flevo Berry website you can find all the licensed propagator and the plant types they provide.

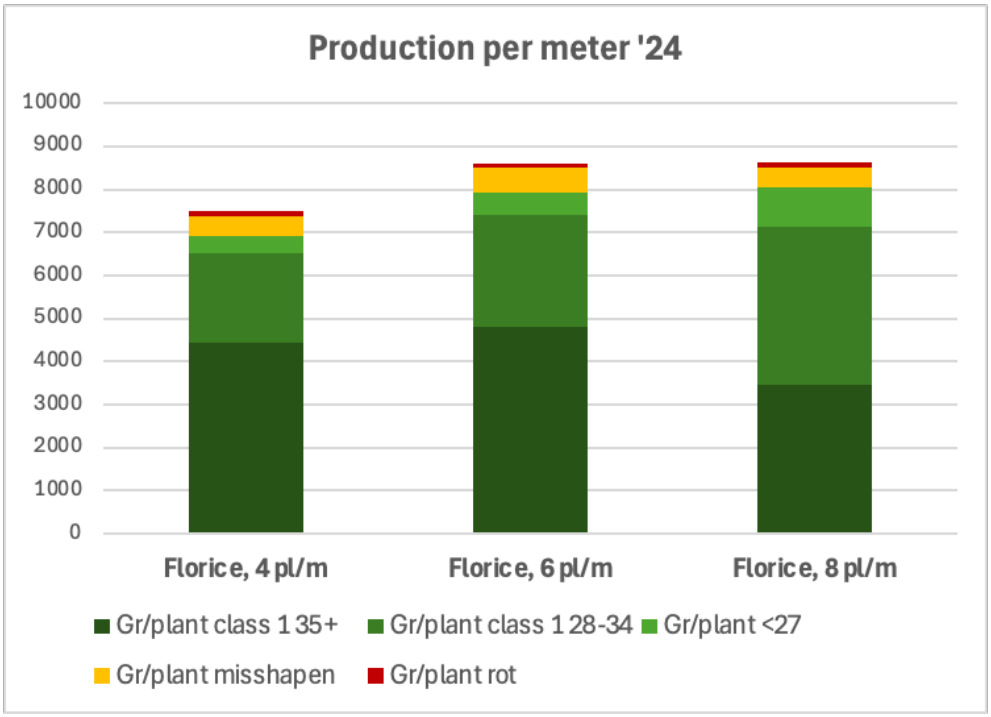
2.4 Plant Density

Florice is usually planted in a single-row system and cultivated for a period of at least 6 months. The plant density on substrate is between 6 to 8 plants per linear meter. In open field cultivation 4 to 5 plants are planted per linear meter. In that case the distance between the rows is often 1 meter.

The denser the planting, the lesser a plant produces. This makes sense since the plant has less space to grow and will capture less light. During cultivation, the yields of different plant densities tend to converge towards the end of the season. It is not uncommon for a lower density to generate the same yield at the end of cultivation.

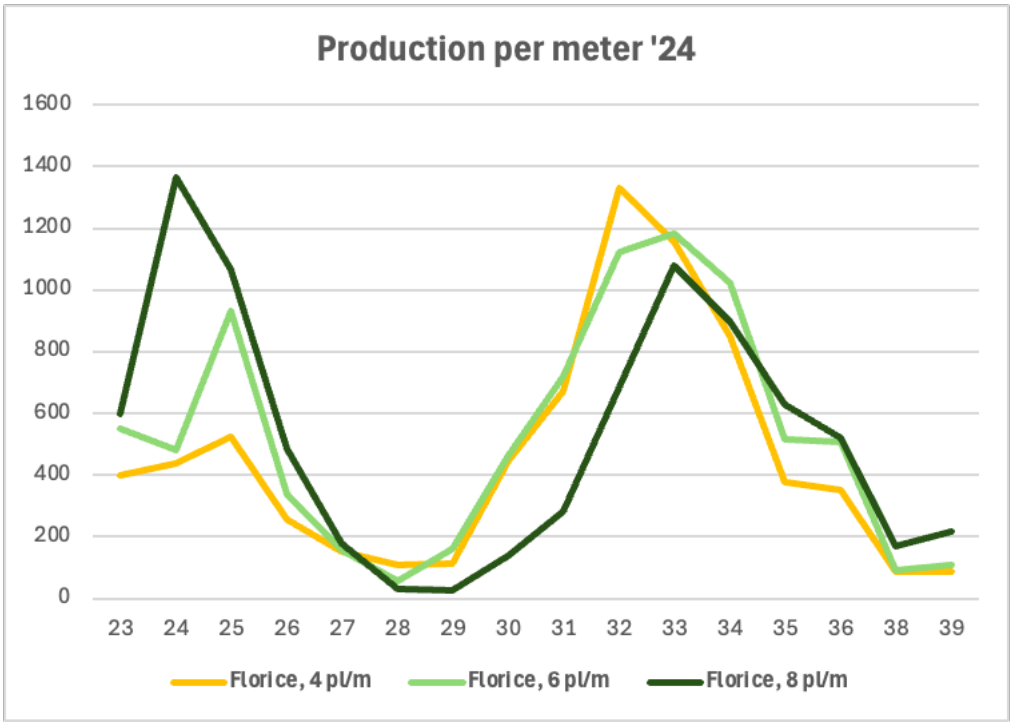
The optimal plant density of Florice strongly depends on the cultivation goal. In a relatively long substrate cultivation (more than 6 months) usually less plants per linear meter are used, regardless of plant type. You will only choose for a higher density (like 10-12 plants per meter) if the focus is on obtaining the largest possible first flush. In such case, the number of plants is often reduced to 6 to 7 plants per linear meter after the first flush. A high density is also chosen if the cultivation is relatively short. In that case, heavy (mini)tray plants are used because of their higher yield potential.

Various studies have been conducted to identify the optimal plant density. These studies mainly focus on substrate cultivation. The table below shows the results of different plant densities from a substrate cultivation (rain cover) in 2024. In all cases, it concerned a cold store tray plant, with a clear harvest dip after the first flush.



We concluded that with 6 plants per meter the same total harvest yield is possible as with 8 plants per meter. The 2023 trial results showed a similar picture. This also has a positive effect on the size of

the berries. A plant density of 4 plants per meter is not recommended given the overall lower yield per meter.



The first harvest peak with 6 plants per meter is lower than with 8 plants per meter. However, the harvest dip is also less pronounced. We have found that a lower plant density has a favorable effect on plant balance and the degree of crop maintenance.

2.5 Generative vs. Vegetative Growth

A balanced plant is important for continuous flower initiation and fruit quality. With a well-balanced plant, we often see a shorter harvest dip, more compact crop, flower trusses protruding above the foliage, and fewer runners.

There are two cultivation phases:

- Generative: flower development, less foliage
- Vegetative: leaf development, fewer flowers

Problems can arise in a very generative crop with many fruits. The fruits consume nearly all assimilates, leaving too little energy for growth. Because the plant expends so much energy on cultivating many fruits, the development of new trusses is also compromised. Flower trusses already initiated in the rhizome can be aborted due to lack of energy.

During the first harvest flush, the plant load can be quite high as there is still limited foliage relative to the number of developing fruits. From flowering until a large flush has peaked, the plant will struggle to regain balance. If growing conditions have been good from the start and during the large flush, the plant will not become overly stressed. The balance between truss formation and plant growth will then gradually be restored.

Overly vegetative growth is accompanied by delayed flower bud initiation. Many runners and side crowns may then form. A switch from vegetative to more generative growth can be stimulated by cultivation measures (see table).

The trick is to steer before the crop is in an undesirable mode, for example by changing the composition of the irrigation and nutrients (see 2.6 and 2.7).

Various factors influence flower initiation in everbearers such as day length, light quality and level, nutrition and irrigation, plant type, transplanting, pot size, substrate, plant maintenance, leaf area, water stress, climate in the greenhouse, tunnel or outdoors, plant load and overall plant health and structure.

The table shows which actions generally result in a vegetative or generative reaction to flower initiation in everbearers.

	Vegetative response	**Generative response**
Climate		
Greater difference between daily and night temperatures	-	+
Longer day	-	+
Shorter day	+	-
Lower pipe temperature	+	-
Higher pipe temperature	-	+
Faster temperature drops at the end of the day	-	+
Slower temperature drops at the end of the day	+	-
Higher daily temperature	-	+
Lower daily temperature	+	-
Higher humidity	+	-
Lower humidity	-	+
Water and fertilization		
Higher EC substrate and water	-	+
Lower EC substrate and water	+	-
Higher substrate moisture content	+	-
Lower substrate moisture content	-	+
Longer dripping time	-	+

	Vegetative response	Generative response
Shorter dripping time	+	-
Lower dripping frequency	-	+
Higher dripping frequency	+	-
Advance the first dripping session	+	-
Postpone the first dripping session	-	+
Advance the last dripping session	-	+
Postpone the last dripping session	+	-

2.6 Water and Nutrient Supply in Substrate Cultivation

Fertilization

Just after planting Florice start with a drip EC of 1.3 to 1.4. A higher EC is often not necessary as they can lead to a rapidly increasing drain EC early in the cultivation, resulting in substrate salinization and the crop wears off faster.

When aiming for a drip and drain EC sum of 2.4, this is generally sufficient. At the start, a supply EC of 1.3 and drain EC of 1.0 (sum of 2.3) is enough. In a harvest schedule, the drip EC may increase to 1.6 provided the drain EC does not rise. The target EC sum should be around 2.6. A few remarks:

- When using water from a well with a certain EC level, you need to make an adjustment for this level in the fertilization recipe. However, lowering the drip EC increases the impact of the water on the composition of the nutrient solution, especially if the water contains sodium, chloride or boron. Therefore, always check the composition of the outlet water.
- The drip EC should not be lowered indefinitely despite a rising drain EC. The drain EC often rises more easily in the second half of cultivation. Lowering the drip EC too much can lead to insufficient nutrients (especially too low nitrate). Therefore, maintain a certain minimum drip EC. It is better to “flush” the substrate from time to time with clean water when the drain EC becomes too high, then switching back to your fertilization recipe again.

Monitoring the crop's nutritional status is very important! Regularly conduct water analyses and adjust the composition of the nutrient solution accordingly.

Florice does not tend to be too generative and easily produced new leafs. The use of ammonium is only necessary when it appears that insufficient new leaf positions or side crowns are being formed by the crop. When using a heavier plant type, some ammonium can be added to the starting scheme to stimulate the crop vegetatively. During cultivation, it can be wise to give a short dosage of ammonium to stimulate the crop vegetatively when needed. From the moment of fruit set, the advice is to omit ammonium.

Standard nutrient solution Florice from planting to fruit set:

mS/cm		mmol/liter								µmol/liter					
EC	K	Ca	K/Ca	Mg	NH4	NO3	Cl	S	P	Fe	Mn	Zn	B	Cu	Mo
1,4	3.2	4.1	0,8	1,3	0	10,0	0	1,6	0,8	50	20	12	15	1,25	1

Standard nutrient solution Florice from planting to fruit set with NH4:

mS/cm		mmol/liter								µmol/liter					
EC	K	Ca	K/Ca	Mg	NH4	NO3	Cl	S	P	Fe	Mn	Zn	B	Cu	Mo
1,4	3,1	4	0,8	1,2	0,5	9,7	0	1,6	0,9	50	20	12	15	1,25	1

When the first fruits start to set, more potassium is needed. Schedules with more than 5.0 mmol/liter potassium as used for June-bearers are not necessary for Florice. In a stage with a very high plant load, the potassium-calcium ratio can be increased from 1.0 to 1.2-1.3 to give a little more potassium relative to calcium. Do this in moderation, because high potassium has an unfavorable effect on growth.

Standard nutrient solution Florice from fruit set and during production:

mS/cm		mmol/liter								µmol/liter					
EC	K	Ca	K/Ca	Mg	NH4	NO3	Cl	S	P	Fe	Mn	Zn	B	Cu	Mo
1,4	3,8	3,8	1	1,3	0	10	0	1,6	0,8	40	10	10	10	1,25	1

Standard nutrient solution Florice from fruit set and during production, higher potassium supply:

mS/cm		mmol/liter								µmol/liter					
EC	K	Ca	K/Ca	Mg	NH4	NO3	Cl	S	P	Fe	Mn	Zn	B	Cu	Mo
1,4	4.2	3.6	1.2	1,3	0	10	0	1,6	0,8	40	10	10	10	1,25	1

The above schemes are derived from the standard nutrition schemes for everbearers. We saw in many tests and trials that no major adjustments to nutrition schemes are needed for a successful cultivation of Florice.

Irrigation

Irrigation has a much larger influence on the success of a Florice cultivation. We consistently see that growers who grow Florice relatively dry achieve better results. Especially in periods with less light you need to make sure not to give the plants too much water in order to remain generative. The last irrigation of the day has the biggest impact.

The substrate moisture content and drain percentage must be monitored daily. During prolonged dark weather and a less active crop, sufficient drain still must be achieved to prevent accumulation of elements in the substrate and thus salinization. In dark weather, it may be wise to give the last irrigation early in the day (for example, at the beginning of the afternoon at 1:00 PM).

On a sunny day, when the plant is very active, the irrigation needs be higher. Then it is also desirable to realize more drain. Again, the note not to give the last irrigation too late in the day (for example, at the end of the afternoon at 4:00 PM).

Drainpercentages subatrate

	First week	**Growth phase**	**Flowiring phase**	**Harvest phase**
Active crop	vochtig	10-15%	15-25%	25-30%
Inactive crop	vochtig	5-10%	10-15%	10-20%

On warm days when a lot of water needs to be given, a varying EC level of the drip water is preferred. To prevent the substrate EC from rising too high, a time block can be built in during the afternoon hours in which dripping with a low EC needs to takes place. In the morning and at the end of the day, a higher EC can be used. By doing so you provide the necessary nutrition at times when the plants need it most and flush out excess salts during the warm afternoon.

For example, one could use a schedule in which on a sunny warm day drip sessions with an EC of 1.5 are given until 11:00 AM, until 3:00 PM irrigations with an EC of 0.9 are given and the rest of the day the drip EC goes back to 1.5.

2.7 Water and Nutrient Supply in Open Field Cultivation A

As with any substrate cultivation, a balanced growth and plant load are also desirable for successful open field cultivation of Florice. The nutrition and irrigation play an important role in this, but strongly dependent on the soil on which cultivation takes place. Since most everbearers in the open field are grown on narrow, plastic-covered soil ridges, irrigation and nutrition takes place via T-Tape or a similar irrigation system.

Florice thrives best on fertile, healthy soil on which the plant can grow as undisturbed as possible. The optimal pH of the soil is between 5.5 and a maximum of 6.0. The water used for irrigation should have a similar pH. If the pH is too high, problems may arise with the absorption of trace elements. With a very low pH main elements such as Ca, K and Mg are absorbed less well.

Before planting, the soil supply of all elements must be brought to a good base level. The motto here is: to measure is to know! The quantities of fertilizers used can best be coordinated with a crop advisor. The fertigation scheme is highly dependent on the soil supply and the crop needs. A good tool to map the crop needs during cultivation is the plant sap analysis.

After planting a basic nutrition is needed to stimulate root formation, such as a starter application with mono-ammonium phosphate. Followed by weekly small applications of calcium nitrate alternated by magnesium sulfate. From the first harvest, calcium nitrate can be replaced by potassium nitrate, alternated with potassium sulfate. This is mainly done when the crop becomes too vegetative or to obtain firmer fruits.

2.8 Integrated Crop Protection and Pollination

Florice is a robust variety, but as with other everbearer cultivations, it is necessary to monitor for diseases and pests and intervene in a timely manner.

Pollination

Florice is attractive to pollinators. In greenhouses and tunnels, overvisitation can occur when bumblebees are used. For example, because Florice is placed next to other varieties or if the balance between the number of flowers and bumblebees is not optimal.

In that case, the bumblebees damage the flower receptacles and the fruits will be misshapen. It is important to always find a good balance between the number of bumblebees and the quantity of flowers. Sometimes bumblebee colonies will have to be temporarily closed, or new colonies added in case of a lot of flowering.

When bees are used, overvisitation is not a problem. However, bees like good weather and take a day off every now and then in dark weather. A combination of bees and a limited number of bumblebees is therefore recommended to always have enough pollinating insects at work.

In outdoor crops, pollination by wind and naturally occurring insects is usually sufficient.

Diseases and Pests Florice is strong against root diseases and powdery mildew, but not invulnerable. In terms of crop protection, an approach based on Favori is usually sufficient to prevent major problems.

Since Florice is often used in longer cultivations, there will always be pressure from insects such as spider mites and thrips. This need not be a problem if the use of natural enemies is started in time. The advantage of a long cultivation is that natural enemies can build up a large population and thereby keep the pests largely under control.

In open field crops without tunnel cover, releasing natural enemies is not very useful. Nevertheless, natural enemies can also make a significant contribution in an open field cultivation. Predatory bugs, parasitic wasps and hoverflies occur naturally in large numbers.

2.9 Crop Maintenance

A good plant balance does not only depend on a good growing climate, good nutrition and irrigation. Physical maintenance of the plant can also make a significant contribution. Focus on a good balance between vegetative and generative growth.

Leaf Picking

We recommend only limited leaf picking with Florice. Old, worn leaves are best removed. They contribute little or nothing to photosynthesis. Moreover, old leaves block light for young emerging leaves and flower trusses.

It is better to remove some older leafs on a regular basis than to prune rigorously only occasionally. This way you keep the rejuvenation of leaves going and prevent plants from ending up with relatively little leaf area and a disturbed plant balance after leaf picking.

Too much leaf picking can also stimulate the occurrence of tip burn, when evaporation and root pressure become too high. When the plants have sufficient leaves, a leaf here and there that covers the fruit trusses can also be removed without any issues.

Removing Flower Trusses

In some cultivations it is wise to remove the first flower truss. Particularly in open field crops where an A bare root plant is used, this is done to first allow the plant to grow more vegetatively and develop side crowns. The harvest may start a little later, but the production and also the quality of the fruits increase significantly as a result.

In substrate crops, the first trusses are usually left, partly to stimulate a good balance between generative and vegetative development. In addition to being able to harvest earlier, the first flush of fruits, particularly from the tray plants, mini-tray plants and plug plants, are of excellent quality, provided the crop is sufficiently vegetative.

Removing Runners

Removing runners should be done regularly. Sugars are transported to the runners while you want these to go to the fruits and to the new leaves and truss formation. Young runners are also more sensitive to powdery mildew and difficult to treat.

Removing Old Trusses

After several harvest months, there are many remnants of fruit trusses on the plant. In general, these do not cause any major problems, except that they take up space and can hinder leaf growth.

3. Cultivation Strategies

By applying different cultivation strategies and using various cultivation systems, it is possible to harvest strawberries year-round. When reading the cultivation strategies, take into account we used averages in terms of growing degree hours and chill hours. The choice of plant material and plant density has, as mentioned earlier, a major effect on the crop. All the harvest date expectations mentioned below are therefore indicative.

When a company keeps good records and data from flower bud research, it is possible to determine the amount of GDH are needed up to the first harvest and/or up to the next major harvest peak. The more experience and data you gather the more accurate a cultivation and harvest planning will become.

We have worked out several strategies for a successful Florice cultivation:

- Protected cultivation (greenhouse) - February planting, harvest from late April to late November
- Protected cultivation on table tops (tunnel) - March planting, harvest from mid-May to mid-October
- Cultivation after early forced June-bearer - April/May planting, harvest from late June to late November
- Double cropping (greenhouse) - July/August planting, harvest from early September to December and early April to mid-June, limited cold period in winter
- Lighted winter cultivation - August planting
- Tunnel cultivation on soil ridges - August planting
- Cultivation in soil ridges (with or without tunnel) - February/March planting

A strategy that is missing is a forced heated cultivation without lighting with a (very) early planting in, for example, December or January. Florice loves the combination of warmth and light. Too high a temperature combined with too little light leads to misshapen fruits in early spring. Also, a tabletop cultivation in a tunnel, using a fresh mini-tray plant, is not included in the list. For now, the risks of this type of cultivation do not seem to outweigh the yields.

3.1 Protected Cultivation (Greenhouse)

Recommended plant material: cold store tray plant, ambient (overwintered) tray plant or mini-tray plant

Harvest period: from late April to November

J	F	M	A	M	J	J	A	S	O	N	D

Option 1: Ambient (overwintered) tray plant - high input

Around mid-February, ambient (overwintered) tray plants are planted, in which flower bud initiation has been actively stimulated by maintaining a minimum temperature of > 9°C in the propagation

greenhouse from early January, combined with cyclical lighting so that the plants experience a day length of at least 14 hours.

When the winter flowers are not removed, the first flush of fruits starts around late April. Due to the spread in flower trussed and by stimulating flower initiation with cyclical lighting from the planting date production will be relatively even.

When the winter flowers are removed, the first flush of fruits is well under way by mid-May. Stimulating flower initiation immediately after planting with cyclical lighting can result in a production pattern with more ups and downs than the alternative with non-removed winter flowers.

Option 2: Ambient (overwintered) tray plant - low input

Around mid-February, overwintered tray plants are planted, where early flower bud initiation is not additionally stimulated. After planting, the greenhouse is kept relatively cold, but preferably not below 9°C and not illuminated. In this case, the winter flowers are preferably not removed because otherwise the plant balance can go too far towards overload due to excessive flower initiation from mid-April (long day > 14 hours).

Flower bud initiation is limited when planting in the greenhouse. It will only really get going from mid-April (14 hours day length), but by not removing the winter flowers, the plant load remains reasonably balanced. From early March to mid-April, cyclical lighting can be an option to stimulate earlier flower bud initiation.

From early April, these plants flower and by early May the winter flowers will have already become fruits. There is a risk that the winter flowers are of lesser quality, which will influence the setting of the fruits.

From early June, the first flush of fruits initiated in the spring is well under way. Due to a controlled plant load, production should be relatively even.

Option 3: Cold store (mini) tray plant

Around mid-February, cold store tray or mini-tray plants are planted. The first winter flowers will be open in early April, after which the first flush of fruits can be picked from early May.

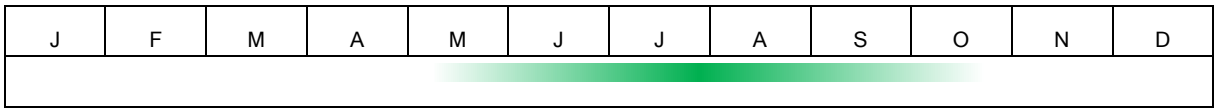
The initiation of new flower buds only starts when the plants are receptive to flower initiation. The cold that the plants have experienced causes a delay. On average, the plants start initiating flower buds again from late March. Partly due to the high plant load during the first flush, the initiation of flower buds will be low until mid-April. To promote flower bud initiation, cyclical lighting from mid-March to mid-April can be an option.

The harvest of the first flush will temporarily decrease from late May. Around mid-June, production will increase again.

3.2 Protected Cultivation on Table Tops (Tunnel)

Recommended plant material: chilled tray, ambient (overwintered) tray or mini-tray

Harvest period: from mid-May to mid-October



Option 1: (Heavy) cold store tray plant or mini-tray plant

If the weather permits and no heavy frost is expected, the tray and mini-tray plants can be planted. The choice for a heavy tray plant (large first flush) or a lighter mini-tray (larger second and, with good weather, third flush) depends on the cultivation goal. Especially after planting, it is important to keep an eye on the weather conditions and protect plants when temperature drops (for example by covering plants with fleece during night frost). In addition, attention for good tunnel management is required, like timely opening and closing of tunnels in order to regulate humidity. But also be keen on a proper pollination of the first flowers with the help of bumblebees.

The first winter flowers will be open mid-April and the first flush of fruits can be picked from mid-May. The initiation of new flowers starts as soon as the plants are receptive to flower bud initiation. The cold that the plants have experienced (before and during cold storage) causes a delay. When the first flush is very large, the initiation of flower buds will be probably postponed until late April. The harvest of the first flush will temporarily decrease from mid-June. From early July production will increase again.

Option 2: Ambient (overwintered) tray plant

As soon as the risk of heavy frost has passed cultivation can start, provided the substrate temperature is not < 8° Celsius. With one planting, harvesting can take place throughout the entire tunnel season. The total yield of an ambient (overwintered) tray is usually at the same level as a (heavy) tray. However, the harvest and thus labor will be much better spread over the season.

It is important that the ambient plants are sufficiently protected against cold as they are more susceptible to cold than a chilled tray plant. It is therefore recommended not to start too early with an ambient plant, unless the temperature in the tunnel can be (somewhat) controlled and the plants are well protected against cold.

3.3 Late Cultivation After Early June-bearer crop (Greenhouse)

Recommended plant material: chilled tray plant, pre-conditioned ambient (overwintered) tray plant or mini-tray plant

Harvest period: from late May to November

After an early heated spring cultivation with a June-bearing variety, the cultivation gutters are free again by the end of April at the latest to start a new cultivation. There are several possibilities to carry out this cultivation with everbearing varieties.

Option 1: Pre-planted ambient (overwintered) tray plant, remove first flower

At the end of March, overwintered, lightly heated and illuminated tray plants are planted in cultivation troughs in a temporary greenhouse for pre-conditioning. Pre-planting (or pre-growing) involves placing plants in a temporary, controlled environment (such as a greenhouse) to promote early growth and development before transplanting them into the main production area. This practice is used to give plants a head start, allowing for earlier fruiting or a more uniform crop. The trusses with winter flowers are removed at the same time as planting.

The new flower initiation is underway and at the end of April, when the pre-planted plants are placed in the production greenhouse, there is already a plant with flower buds initiated in the spring. There is probably already flowering in the plants. The first large flush of strawberries can be expected from the end of May, while flower bud initiation continues. There may be a small dip in production because of the high plant load during the first harvest flush.

Option 2: Pre-planted ambient (overwintered) tray plant

At the end of March, overwintered, cold-kept and unlit tray plants are planted in cultivation troughs in the temporary greenhouse for pre-conditioning. The winter flowers are not removed. From the end of March, these plants flower and at the beginning of May the winter flowers will have already become fruits. However, the first fruits may be of lesser quality.

Flower bud initiation in the plant material is already limited, but it will only really get going from mid-April (> 14 hours day length). By not removing the winter flowers, the plant load remains reasonably balanced.

As soon as the cultivation gutters in the production greenhouse are free again, the plants can be moved there. From the beginning of June, the first flush of fruits initiated in spring start to form. Due to a controlled plant load, production will be relatively even.

Option 3: Pre-planted cold store tray plants or mini-tray plants

When the cultivation troughs with the pre-planted plants are placed on the cultivation gutter at the end of April, the first winter flowers will be open. The initiation of new flower buds only starts after a few weeks. On average, the plants only start initiating flowers again at the beginning of May.

The harvest of the first flush of these plants will begin in early June. Production will temporarily decrease from the end of June and will only increase again towards mid-July.

Option 4: Cold store tray plant or mini-tray plant

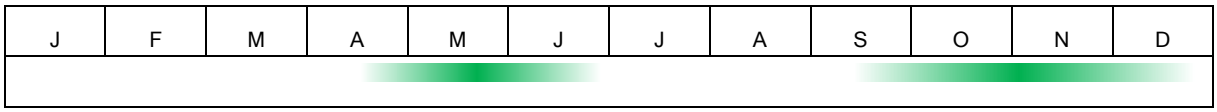
At the end of April, chilled tray or mini-tray plants are placed directly on the gutter in the production greenhouse. It can be interesting to work with a high plant density (for example twelve plants) and when continuing the cultivation to remove part of the plants (leave six or seven plants) to make room for the remaining plants. In that case, the cultivation goal is to achieve a maximum first flush followed by a later smaller flush.

The harvest of the first flush of these plants will begin at the end of June. Production will temporarily decrease around mid-July and increase again at the end of July, because flower bud initiation only started again at the beginning of June (after a period of not being receptive to flower bud initiation).

3.4 Double Cropping in a Greenhouse

Recommended plant material: chilled tray plants or fresh mini-tray plants.

Harvest period: first harvest from September to December, second harvest from April to June



Double cropping with an everbearing variety is not yet common practice. Nevertheless, good results have already been achieved and this cultivation method offers perspective. Planting in the summer should preferably take place a little earlier than with a regular double cropping with June-bearers. Otherwise, the production level in the fall will be too limited.

In general, the greenhouses intended for double cropping are empty during the month of July and earlier planting is not a problem. We strongly recommend the possibility of cooling the crop with misting and/or roof irrigation for a sufficiently vegetative start of the cultivation.

Due to a prosperous start, in a planting period that is usually under relatively high temperatures, the preference is for chilled mini-tray or tray plants. An alternative can be a fresh tray plant, cut around the beginning of June of the same year.

The planting time for fresh tray plants is around mid-July, or earlier when the plants are ready to plant. If chilled plants are used, it is recommended to plant in the outdoor air in the troughs from the beginning of June. Then these plants still have enough time to initiate new trusses. In July they are then placed in the greenhouse.

It is wise to use steering light ("flowering bulbs") from August due to decreasing daylight for the stretching of flower trusses and leaves.

From the beginning of September, the harvest of all plant types will start. With a chilled plant, a higher production can be achieved in September, less in October and perhaps more again in November. With a fresh tray plant, the autumn production will mainly be harvested in October and November. The spring production is expected to be similar for both plant types.

The harvest will gradually decrease from mid-November due to lower radiation, after which the temperature is kept at a minimum of 7 degrees from Christmas to quickly restart flower initiation in the spring (too much cold inhibits flower initiation).

At the end of January, the heating can slowly be turned on again, as with a regular double cropping of June-bearers. However, make sure that the plants have then received at least 400 chill hours. The plants may then be cleaned up, whereby the number of rhizomes per plant is also limited to 3 to avoid a too bushy plant shape.

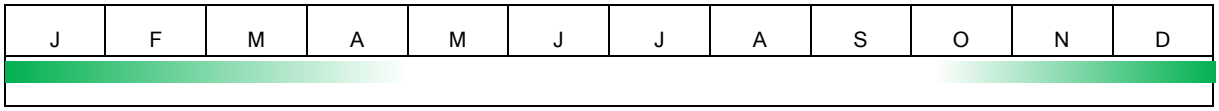
The cyclical lighting may also be switched on again from the end of January for the stretching of plants. It is wise to create a day length of at least 16 hours. To be able to pick plenty of strawberries in June and possibly even longer, it is recommended to keep the cyclical lighting on until mid-April.

Around mid-April, the natural day length takes over from the artificial light. The spring harvest will start from mid-April and can continue until the end of June or longer, depending on the possible post-cultivation.

3.5 3.5 Winter Cultivation in a Heated Greenhouse with LED

Recommended plant material: freshly cut mini-tray plants

Harvest period: from late October to early summer (if grown in balance)



The search for a reliable method to achieve a high production of excellent quality strawberries from everbearing varieties, even during the darkest winter months, continues. Good results have already been achieved, but it is not yet entirely clear exactly which knobs need to be adjusted to steer the plants even better in the direction the grower wants. By using a fresh mini-tray plant you will have the best chance of success as it is easier to keep in balance.

Until mid-August, fresh mini-tray plants are planted in the greenhouse. The tips for these plants are cut mid-June of the same year. At the beginning of August, the cyclical steering light must be switched on to make sure the plants experience a long day. The preference is to create a day length of at least 16 hours, whereby 16 hours before sunset you need to put on the lights. As a result, the plants will experience a natural transition into the night. By following this procedure stretching of the plants is stimulated and you prevent them from going into dormancy.

In the beginning, just after planting, there is still sufficient natural radiation, so additional lighting with LED light is not necessary. Additional LED lighting is not even desirable until September 15, because the assimilate requirement is still limited at that time. An amount of 10 moles of PAR light per day (measured at crop height in the greenhouse) seems sufficient until September 15.

As the size of the crop increases, the LED lighting must be increased in steps between September 15 and October 15, until a total PAR level of 15 moles is reached. This gradual increase can be achieved on the one hand by initially only working with an LED lighting duration of 14 hours, while the steering light continues to provide a minimum day length of 16 hours.

Another measure that can be taken at the same time is to switch on the LED light only when a certain amount of radiation in Watts per m2 is not achieved and to switch it off when the number of Watts is exceeded. Between September 15 and October 15, the number of realized moles per m2 must be brought to the maximum level of 15 moles per m2 as a smooth line. In this way, the supply of light energy can keep pace with the assimilate needs of the crop.

In terms of light spectrum, it is important that in addition to blue and red light, far-red light is also administered. This spectrum is important for the stretching of petioles and trusses. When using 'flowering bulbs', the plants automatically receive far-red light.

After New Year, the amount of natural radiation slowly increases again. From this date, the amount of LED light can be gradually reduced again when it exceeds the maximum daily total of 15 moles of PAR light per m2.

Until the end of the cultivation, a radiation sum of 15 moles PAR is sufficient. When the harvest lasts until mid-April, the control light can be switched off at the beginning of March.

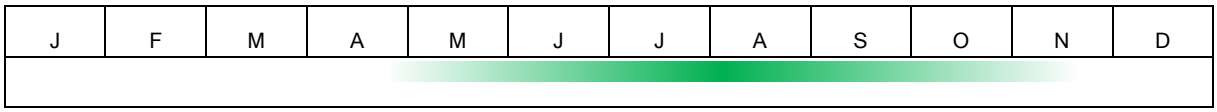
During cultivation, old and worn leaves must be removed regularly. It is best to do this every 2 weeks, removing a maximum of 2 worn leaves per plant. This allows more light to reach the young leaves. Half-worn leaves often contribute no more than 50% to photosynthesis, so it is better to remove them in favor of young active leaves.

The harvest of this crop can begin at the end of October and can continue until the beginning of summer, depending on the condition of the crop and the objective of the grower.

3.6 Overwintering Tunnel Cultivation in Soil Ridges

Recommended plant material: fresh green plants or fresh plug plants

Harvest period: from early May to mid-June, possibly longer.



This cultivation method is a relatively simple and inexpensive way to cultivate everbearers. The art is to get the plants through the winter well and healthy, but then it can also be an extremely lucrative crop.

The optimal planting time is around August 20. Then the plants still have ample time to form several side crowns and induce enough flowers for the following spring.

During September and October, the flowers and runners must be removed regularly. Until spring, keep plastic film or horticultural fleece on hand to cover the plants during frost periods.

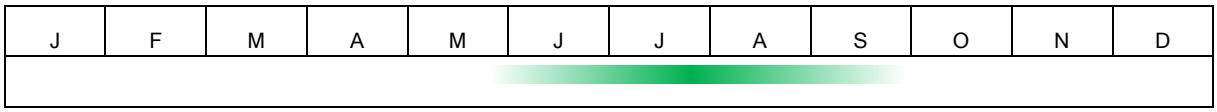
From the beginning of April, the plants will start to bloom, after which the harvest will start around May 1. When the plants have grown well in autumn and have formed multiple side crowns, the first flush will be enormous!

At the beginning of June, the first large flush is over. After that, there is the choice to leave the crop or to end the cultivation. The production of the flowers created in spring will not start again until July.

3.7 Summer Cultivation on Soil Ridges with Black Plastic

Recommended plant material: Frigo A or A+ plant

Harvest period: from early July to late September



This relatively simple cultivation is carried out on a large scale in Germany. At many farms, this cultivation method has replaced a late cultivation with June-bearers. The harvesting labor of this everbearer cultivation is more spread out than that of a cultivation with June-bearers. As a result product sales can also be spread out over a longer period.

In the course of March, when the weather permits and the soil temperature is preferably not below 8° Celsius, this cultivation is planted.

Before planting, soil ridges are made. The ridges are then covered with black plastic. At the same time, a T-tape or similar irrigation system is installed, which is placed on the ridge under the plastic.

In this system, the rows are 1 meter apart. In the row, 4 to 5 plants are planted per linear meter. After planting, the ridges are often covered with horticultural fleece to create extra earliness.

In May, the plants start flowering. However, the first trusses of these plants are removed to first stimulate more vegetative growth. The harvest may start a little later, around July 1, but the quality of the fruits will be better and the final yield higher. Moreover, harvesting in this manner only starts when the large harvest of the overwintered June-bearers in the field is over and thus in a price point perspective often attractive period of the year.

The end of the harvest period is highly dependent on the weather conditions. With a pleasant late summer, the harvest can continue until October. With a bit of bad luck due to a lots of rain, the harvest may be largely over by late August.