

CULTURAL DIRECTIVES

L I M O N I U M

perennial varieties



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Limonium hybrids

Botanical family : Plumbaginaceae.

genus: Limonium species: latifolium, hybrid, altaica, dumosum, sinensis
common name : 'Statice'

Perennial Statice (Limonium), with their very high utility value, now draw very close attention from many markets all over the world. Their unique branches are essential for bouquets, corsages and other flower arrangements.

Also the market is very enthusiastic about the new Limonium varieties:

- special colour
- natural colour (not painted)
- strong stems

Limonium requires very little attention as it is a desert plant originating from the mediterranean area. Having adjusted to grow in a very dry environment some varieties require less attention as well as less water and fertilizer. Limoniums are labour saving species and very easy to grow. Outdoor cultivation is possible only for varieties which are hardy and therefore can sustain very low temperatures, eg. Northern hemisphere.

Tissue culture

The plants come from Tissue Culture and are rooted and established by Hilverda B.V. in Holland. Tissue Cultured Limoniums is a reasonably new product.

The advantages of Tissue Culture plants are:

- a higher flower production per plant
- a better flower-uniformity and plant-uniformity (in length and colour) than Limonium produced from seed
- less plants per square metre to be planted
- higher resistance to disease

Limonium can be grown for 4 - 5 years for flower production although earlier replacement is advised so that a high standard of flower quality and quantity can be maintained.

Introductions

The base of the plants are vegetative. The stems are thin and do not take up much space whereas the top of the plants have a large volume. Flowers are very small, each stem contains a large amount of flowers. The branches are spaced out, the plant has a pen root with many little side shoots penetrating approximately 60-100 cm into the ground.

Free Flowering Varieties

SOUTHERN HEMISPHERE

varieties	planting time	flowering period	Average estimated production per plant
Beltlaard	as from June - July	3-4 months later	15-20 stems
Ocean Blue	as from June - July	3-4 months later	15-18 stems
Splash Blue	as from June	3-4 months later	15-18 stems
Topian Blue	as from June - July	3-4 months later	12-14 stems
Emille vars	as from June - July	3-4 months later	20-25 stems
Maine Blue	as from June – July	3-4 months later	20 stems
Montana	as from June - July	3-4 months later	20-25 stems

For northern Europe production, the average estimated production per plant in 2nd year is as follows:

- Beltlaard 12-15 stems
- Emille varieties 20 stems
- Ocean Blue 12-15 stems
- Splash Blue 15-18 stems
- Donau 20 stems
- Montana 20-25 stems

Planting time for Northern Europe is January-May indoor/heated glasshouse. Outdoor planting is ideal between May - August. The only varieties mentioned above which are resistant to low temperatures are the Emille varieties, Donau and Montana.

These varieties can give continual flower production, whereas the seasonal flowering varieties flower in flushes.

Planting

Planting can take place as from June - July (Southern Hemisphere) or January-May (Northern Hemisphere) for the free flowering varieties.

The first stems can be expected 3 - 4 months later.

For the cultivation of limoniums any type of soil is suitable, except 'clay soils'; which are too heavy for this crop. The soil should be well drained; sandy or sandy-clay soils are recommended owing to its porousness. Altaica's prefer clay type soils. When necessary, we advise to fumigate or to steam sterilise. This will also control possible weed problems.

Furthermore, it is important that the growing points (eyes) of the plants can be reached by light. The plants should not be planted too deep and the eyes should not be covered by soil.

Planting distance

The advised planting distance between each plant is 30 x 30 cm.

It is recommended to plant two rows per bed, each bed should be 1 metre wide with paths in between the beds of at least 40 cm wide, and to use one layer of 17x20 cm mesh support wire.

$$\underline{6 \text{ plants per net m}^2 = 3 - 3.5 \text{ plants per gross m}^2}$$

Planting more plants per square metre will result in more stems per square metre but a lower average quality.

Emille may be planted with 8 plants per net m² = 4 - 4,5 plants per gross m².

Basic fertilization

Once the soil has been rid of diseases a small amount of fertilizer may be added as basic manuring. Generally limoniums do not need much fertilizer at all.

Basic fertilization before planting the crop:

3-5 kg sulphate of potash magnesium	($K_2SO_4 + MgSO_4 \cdot H_2O$)	
3-5 kg magnesium sulphate	($K_2SO_4 MgO + K_2O$)	> per 100 m ²
3-5 kg triple super phosphate	($Ca(H_2PO_4)$)	

Once the fertilizer has been added the soil must be ploughed up deeply here after the mud clogs must be broken down to finer soil particles. Before the soil is completely ready for planting, it must be moist just as for any other flower crop.

A soil pH of 6.5 and an EC of 1,0 is ideal for the cultivation of limonium.

Cultivation

Advised planting capacity to start would be between 1000/1500 m² per variety for flower production.

Long days promote the development of flowers as flowers are very sensitive to light intensity, which is a necessity in the blooming period. Insufficient sunlight normally causes long and elongated weak stems and flowers never mature. This statement should explain the fact that no shading or whitewashing of the greenhouses should take place.

NORTHERN EUROPE

Each bed should have one heating pipe which is placed on the first support layer approximately 30 cm above the ground. If placed on or too close to the ground it will dry out the soil and circulation is poor. The heating pipe is used to dry out the crop in the mornings when it is very moist, so to prevent any possibilities of Botrytis or other diseases breaking out. Another important factor to prevent diseases is ventilation in the greenhouses which is at all times important and must occur day and night. At night it is not necessary to have the windows open as wide as during the day. Good air circulation helps prevent humid conditions and to keep the plants dry.

Temperature

Average daily temperatures between 22-27°C and 12-16°C at night are the most suitable temperatures for ideal flower production. Winter production in Northern Europe between November-April is not possible as a result of the poor light intensity. The plants absorb water at night, if this moisture remains on the crop and humid conditions occur an outbreak of Botrytis is highly likely, or even downey mildew.

Especially in the morning in the greenhouse there should be sufficient ventilation to get rid of the moisture amongst the plants.

Fertilization

Liquid or solid fertilizers may be used.

limoniums being a labour saving crop generally do not need much fertilizer. This statement also depends on the soil which the crop is being grown on. Additional fertilizer should be applied in accordance with plant growth and based on soil analyses. Generally, they require KNO_3 , $MgSO_4$, K_2SO_4 , especially during the generative growth.

Watering

The most important factor is to keep the crop as dry as possible, especially the upper part of the plant. The flower heads must not come into contact with the water at all. In the first growing stage of the plants a sprinkler or an overhead water system may be used to water the plants until the plant has developed a rosette pattern, it is then essential that drip system or hand watering takes place so as to keep the plants as dry as possible. This will decrease the possibilities of Botrytis occurring.

limonium does not need much water, although this varies depending on the soil type on which the crop is being grown.

One normally gives water when the plant shows signs that it has an insufficient supply of water, generally speaking at least 3x per week in Southern Hemisphere.

The reason that the plants do not need much water is that the crop absorbs enough at night to keep growing and remain healthy. This can be proven if you were to walk through the crop in the morning you will notice how wet the plants are. The heart of the plant should not be wet when watering the plants this may result in the reproduction of micro organisms to occur which is a common fact amongst rosette forming plant. The advised and most suitable method of watering is by placing two drip tubes per bed, one tube per row of plants.

The altaica varieties (Donau, Montana, Splash Blue and the Emille's) require much more water.

Harvesting

As mentioned earlier, harvesting can be expected 3 - 4 months after having planted (free flowering varieties), this depends on the variety. Flower should be picked when about 90% of the flowers show colour and are open. Flowers must not be picked too raw, because once picked and in a vase the flowers do not open. Therefore, picking the flowers is advised to be done when as many flowers as possible are ripe.

For the Dutch market for the bunching of flowers please put 5 stems in one bunch and then 5 bunches in one bundle (in total 25 stems). It is advised that flowers be picked shortly before being taken to the market. Do not leave the flowers standing in water for a long period of time.

Flowers must not be packed in boxes unless the field heat is out of the flowers. This is detrimental to the lifespan of the flower. Flowers must also stay in the same condition, i.e. grading shed, before being placed in another condition. As the more climate/conditions the flowers are placed in the shorter the vase life !

Diseases

Never use DDVP, this will cause burning of the crop !

Botrytis

The most occurring disease in limonium is Botrytis.

Botrytis cinerea or grey mould is a fungus that forms on leaves or the flowers causing irreversible damage. Conditions encouraging Botrytis are a high humidity and a high moisture content of the soil.

When the humidity level is over saturation point (100% relative humidity) the air cannot hold any more moisture and condensation will occur. It is only in the presence of free standing water that Botrytis spores germinate if the temperature is above 5-6°C. Early symptoms of Botrytis are yellow leaves, loss of foliage, small white or brown spots on the petals and leaves (in dark coloured petals the spots are brown and soft; in light coloured petals they are white and circular). Once these spots develop into fuzzy grey mould, the spores are released into the air infecting the surrounding flowers.

Preventive:

- Refrigerated units should not be above 5°C.
- Wet flowers should never be placed in the cold room.
- Bunches should be bunched loose enough so that the moisture released by transpiration from the foliage can evaporate.
- Any damaged, diseased or decaying flower or foliage should be removed as they are very vulnerable to an outbreak of Botrytis.
- Whatever the flowers come into contact with e.g. containers, buckets etc. should be clean.

Spraying:

1. Beginning of the crop: - spray 1 gr. Fongarid per m² after planting
2. In course of time: - spray 200 gr. Rovral per 100 liters water + 30 cc Agral wetting agent
 - or, spray 100 gr. Rizolex /100 l water
 - or, spray 150 gr. Eupareen /100 l water
 - or, spray 200 gr. Benlate /100 l water
 - or, spray 200 gr. Mancozeb /100 l water
 - or, spray 200 gr. Ronilan /100 l water
3. During flowering:
 - Smoke with Termil H. smoke tablets
 - Dust with TMTD

spray using a low volume high pressure spray !!

Sclerotinia

Spray(per 100 liters water):

- 50 gr./ml Sumisclex
- or, 200 gr. Rovral

Rhizoctonia

Drench/spray(per 100 liters water):

- 100 gr. Rizolex, after spraying, rinse/wash off with clean water
- or, 200 gr. Rovral
- 150 ml. Bavistin + 100 gr. Rizolex (as a drench)

Powdery Mildew

Preventive spraying(per 100 liters water):

- 100-150 ml Bayor
- or, 40 ml Curamil (Pyrazofos)
- or, 100 ml Funginex (Triforine)
- or, 40 ml Rubigan (Fenarimol)
- or, 200 gr. Benlate (Benomyl)
- or, 100-200 gr. Bavistin, Mycocarb (Carbendazim)
- or, 200 gr. Topsin M.

Preventive dusting:

- 300 gr. Zineb dusting powder,
- or, 350 gr. Maneb dusting powder

Downey Mildew

If visible, spray every 5 days(per 100 liters water):

- 200 gr. Fongarid
- or, 150 ml Previcuur
- or, 250 gr. Aliette
- or, 300 gr. Zineb

systemic/drench:

- 2 gr. Aliette/m²/4m³/1000 m²

Red spider mite

Spray once every 7-10 days(per 100 liters water):

- Pentac 100 gr./ml + 30 ml Agral
- or, Nissorun 50 gr./20 ml
- or, Apollo 30 ml
- or, Vertimec 25 ml
- or, Talstar 40 ml (only in glasshouse)

Louse

Spray(per 100 liters water):

- 50 gr. Pirimor
- or, 75 gr. Undeen
- or, 60 gr/ml Parathion
- or, 40 ml Talstar

Cutworm, Caterpillars etc.

Spray(per 100 liters water):

- 50-100 gr. Bactospeine
- or, 50-100 gr. Ambush
- or, 100 gr. Nomolt
- or, 100 gr. of 100ml Lannate
- or, 100 -150 gr. Dipterex
- or, 25 ml Agrichem Permethrin

Scutigerella

Treat soil with Curater.

- Prepare the soil mix in the Curater. After adding Curater to the soil drench by watering using lots of water to break down the Curater.

Beatles, Taxusbeatle

Spray once per week and repeat this for some weeks, hereafter 1x per 14 days, repeat this 1x 14 days 2-3 times.

Spray(per 100 liters water):

- Actellic 50-100 ml
- or, Orthene 50 gr.
- or, Parathion 100 ml, before adding, the soil should be moist, thereafter rinse, wash off the Parathion by watering.

Soil treatment with Curater, rinse and drench soil hereafter

- Drench with 150 ml Parathion

Rust

Spray(per 100 liters water):

- Baycor liquid 150 ml
- or, Mancozeb 300 gr.
- or, Zineb 300 gr.
- or, 100 ml Triforine (Funginex)

Characteristics

Lim. hybrid Beltlaard

'Beltlaard' has characteristics which are very similar to those of 'Saint Pierre'. It grows to about 100-150 cm tall. The branches are spread out wider, but never sparsely.

The planting distance is 30 cm x 30 cm. Production can be expected to be roughly 15 stems per plant per year throughout the year considering conditions are suitable. Just like 'Saint Pierre' it has dark blue flowers. Planting can take place between January and June in the Northern hemisphere, and between May - August in the Southern hemisphere.

Lim. hybrid Ocean Blue

'Ocean Blue' is a hybrid of *L. latifolium* and *caspia* crossing. It grows as tall as 110 cm and has a blue flowers, stems are compacter than 'Beltlaard' and 'Saint Pierre'. Planting can take place in June and the first stems harvested in October/November in the Southern hemisphere. The planting distance is 30 cm x 30 cm and the beds 1 meter wide, two rows of plants per bed. Drip irrigation is recommended, two drips per bed. At least one layer of broad mesh is needed.

limonium 'Ocean Blue' can produce up to 15 stems per plant in the second year.

The flower colour is soft blue.

Lim. lat. Splash Blue

This variety has familiar growth characteristics to the Emille-group. The plant establishes a rosette fairly quickly and then generative growth. The stems grow to approx. 60-70 cm tall. One layer of support mesh is required. Two flushes per year can be expected. Flower colour is dark blue.

Lim. altaica Tall Emille + Tall Pink Emille

The stem length is approx. 15-20 cm taller than Emille, flowering starts earlier and continues longer. Production is the same as other Emille varieties, although these varieties are more continual producers, they do not really flush.

Flower production can also continue at lower temperatures i.e. day: 18°C, and night: 12°C.

Lim. hybrid Montana

Montana has characteristics similar to those of Donau. The colour of the Montana flowers is blue.

Flower production can be expected to be about 20-25 stems per plant in the second year.

The stems grow to approx. 70-90 cm tall.

* HilverdaKooij cannot be held responsible for the result/effect on a crop due to the advice and the information in the growing manual.