



Helleborus niger



Central Europe
North Europe



Christmas Carol

© 2020 Syngenta. All rights reserved. The publication and its content is proprietary to Syngenta. It may not be photocopied or reproduced in any form. Product names marked © or ™, Syngenta Flowers, the SYNGENTA Wordmark and the SYNGENTA Logo are trademarks of a Syngenta Group Company. Syngenta has exercised reasonable care and skill in compiling this publication. All data in this brochure is intended for general guidance only and the user should apply it only for the purposes for which it has been created and in accordance with his own knowledge and experience of local conditions. Syngenta cannot accept any liability in connection with this advice.

Finished Plant Helleborus

Series 	Type 	Leaf colour 	Pot size 	Comment
Christmas Carol	compact	dark green	10.5–17 cm	more plants/pot up to 17 cm

Remarks

Helleborus is a slow growing crop and does not show problems quickly. When you see them the problem is not small anymore. Advise: Control the main growing factors weekly, and adjust them regularly to avoid culture problems.

Calendar Week	8	10	12	14	16	18	20	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	
Scheduling wk 8 for pot 17 cm, wk 12-16 for 13 cm, wk 18-20 for 9 cm pot. For big pots or scales 3 plants per pot can be used.	P						S									F	F	F	F	F	F	F	F	F
		P						S								F	F	F	F	F	F	F	F	F
			P						S							F	F	F	F	F	F	F	F	F
				P						S						F	F	F	F	F	F	F	F	F
					P						S					F	F	F	F	F	F	F	F	F
						P						S				F	F	F	F	F	F	F	F	F
							P						S			F	F	F	F	F	F	F	F	F

Cultivation Advice

Helleborus is a product for specialists. Because of the specific water and substrate demands it does not fit with other crops.

Main success factors are potting in time, temp. and humidity controlled climate, perfect watering system and drainage. Screening options, Biological aphids control, and balanced, complete and controlled fertilization.

Important: Helleborus is a slow growing crop and does not show problems quickly. When you see them the problem is not small anymore. Advise: Control the main growing factors weekly, and adjust them regularly to avoid culture problems.



Pests

Main risk is aphids. Especial in summer it can be rather invasive. Chemical treatment is limited due to the plant structure. Biological control works well, when applied in time and correctly. Black flies also need to be controlled biologically.



Diseases

Next to Botrytis, Fursarium and other rood fungus are the main risk. This can be avoided by:

- Airy substrate.
- Top water management.
- Use of Hicure, especial after challenging hot periods.
- Plant distance and climate control.
- Focus on plant condition.



Fertilization

Start direct after potting with a balanced fertilizer, containing all elements. Based on the water quality. Especial Calcium is very important to improve plant condition. Continue during summer, and make sure the EC is on level during whole culture. Control EC and pH levels twice a month. The use of potassium phosphite (KH_2PO_3) will strengthen the plant against disease.



Irrigation

Helleborus need a regular humidity. Avoid overwatering inside, and make sure fields are drained. Avoid too wet and too dry.



PGR Applications

When needed some Alar can be used.(2 gr/ltr). It can give some delay in flowering. Alternative is Tilt (propiconazole) 10-15 cc/100 ltr water, and max. 3 times a week.






Recommendations

Culture guideline at optimum average daily temperature 16–25°C:





Culture week	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	
Handling	P	P	P	P	P	P	P												F	F	F	F	F	F	F	F	F	
Temperature D/N	>18°C						18-23°C												14-18°C									
Light	Ass. light possibility in early weeks and latest weeks inside																											
Shading	* natural light						500-600 W/m2 + white wash												* natural light									
Humidity	70–85%						60–85%												70–85%									
Moisture	3–2		avoid overwatering																									
pH	5,0–6,0																											
EC growing medium	0,8-1,2 mS/cm						1,0-1,4 mS/cm																					
EC feeding in mS/cm	1,5 mS/cm						2,0-2,5 mS/cm, depending on plant and pot size																					
Fertilizer	Complete AB schedule N:K 1:1,5 - 1:2,0 based on waterquality																											

Legend







Soil moisture level

	5 saturated: water is easily observed. When the substrate is touched, water moves out freely from top to bottom.
	4 wet: water is not easily observed. When the substrate is touched, there is very little movement of water from top to bottom.
	3 moist: the substrate is black but not glistening. When the substrate is touched, there is water, but virtually no water movement.
	2 medium: the substrate turns from dark to medium brown. There is no water movement when touched.
	1 dry: the substrate changed color to very light brown.








Culture stages Cuttings / Seeds

	callus development / germ1, radicle emergence
	root development / germ2, cotyledon expansion
	leaf development / plug bulking
	plug finishing / plug finishing










EC zones feeding mS/cm

	1 0,5–1,0 mS/cm
	2 1,0–1,5 mS/cm
	3 1,5–2,0 mS/cm
	4 2,0–2,5 mS/cm
	5 2,5–3,0 mS/cm
	6 3,0–3,5 mS/cm







EC zones growing medium mS/cm (Sonneveld 1:1,5)

	1 0,5–0,75 mS/cm
	2 0,75–1,0 mS/cm
	3 1,0–1,25 mS/cm
	4 1,25–1,5 mS/cm
	5 1,5–1,75 mS/cm
	6 1,75–2,0 mS/cm
	7 2,0–2,25 mS/cm




Temperature zones

	1 0–5°C
	2 5–8°C
	3 8–12°C
	4 12–14°C
	5 14–16°C
	6 16–18°C
	7 18–20°C
	8 20–22°C
	9 >22°C

Light zones

	1 total darkness
	2 short day <12 h/short day treatment
	3 shaded
	4 no-shading / natural light
	5 supplemental light > 14 h/long day treatment
	6 night interruption

Shading

	1 shading > 250 W/m2
	2 shading > 450 W/m2
	3 shading > 750 W/m2

ST	sticking URC	PC	plastic cover
RD	root development	L	lift cover
SC₀	sowing no Vermiculite cover	G	gapping
SC₁	sowing plus light Vermiculite cover	TP	transplanting
SC₂	sowing plus medium Vermiculite cover	T	ypl transplanting
SC₃	sowing plus thick Vermiculite cover	C	cover to protect from frost
RE	radicle emergence	PGR	PGR treatment (spray)
Cot	cotyledon	PD	PGR treatment (drench) or heavy spray
M₁	mist day and night	<	pinch
M₂	mist day – dry night	DB	disbud
W	end mist	P	potting
FC	fleece cover	S	spacing
PC	plastic cover	F	flowering
		LF	leaf removal and maintenance