

# 2018/2019

Perennial Seeds · Staudensamen



*Jelitto*<sup>®</sup>

# Price List 2018 / 2019

(valid for two years)

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Manager: Mary Vaananen · e-mail: [maryv@jelitto.com](mailto:maryv@jelitto.com)

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e-mail: [oscogarden@jelitto.com](mailto:oscogarden@jelitto.com)

**Trade register:** Walsrode HRB 497

**General Manager:** Georg G. Uebelhart

**General directions:**

Prices in EURO/€!

**Minimum order value 25 € net. Orders less than 25 € will be charged the difference.**

**Minimum charge per item 2 € net.**

**During the busy season Jan./Febr. and May/June please allow 1-2 weeks for order processing. Please order well in advance!**

**Orders are generally shipped air parcel post but courier service is available upon request.**

**According to our experience it can take from pick-up to delivery up to 30 days via air parcel post and is impossible to track. By courier it will take 2, to maximum 5 days, and it is possible to track anytime, but is more expensive. The seed offered of endangered plants is not collected in the wild.**

**Our seed is not edible, and is only suitable for the production of plants. Please note that some seeds and plants are toxic! Jelitto cannot be held responsible if seeds or plants are eaten.**

Online-Shop and websites:

<http://www.jelitto.com>

Download Order Form

Our VAT Reg. No. is:

**DE 118576356**

**Payments requested by Credit card!**

Other payment methods with credit approval:

- Direct money transfer in EURO € to one of our bank accounts (see right). All banking charges are for the account of the buyer.
- Check; Draft in EURO € drawn on a German bank. US \$ check drawn on a US-Bank, GBP £ cheque drawn on a UK-Bank. Other currencies cannot be accepted. All banking charges are for the account of the buyer.
- For the USA and Canada the invoice will be converted into US \$, for the UK the invoice will be converted into GBP £, according to the actual exchange rate. Conversion table see inside back cover.
- The prices in this list are not binding and exclude tax. Customers outside of Germany in the European-Union who do not have a VAT Reg. No. will be charged additional value added tax (Nov. 2017: 7%).

Please supply us with your VAT Reg. No. when ordering.

**Bank accounts:**

Commerzbank Celle, Germany  
SWIFT-BIC: DRES DE FF257  
IBAN: DE94 2578 0022 0419 9923 00

Kreissparkasse Walsrode, Germany  
SWIFT-BIC: NOLA DE 21WAL  
IBAN: DE32 2515 2375 0008 1280 01

Postbank Hamburg, Germany  
SWIFT-BIC: PBNK DE FF200  
IBAN: DE45 2001 0020 0278 0792 02

Basellandschaftliche Kantonalbank, Switzerland,  
CH-4144 Arlesheim, SWIFT-BIC: BLKB CH 22 769  
CHF-Acc. IBAN: CH37 0076 9016 3103 3751 4  
€-Acc. IBAN: CH54 0076 9016 1443 0948 6

Commerzbank London Branch, UK  
SWIFT-BIC: COBA GB 2X  
GBP/£-Acc. IBAN: GB41 COBA 4062 0130 5094 50



## Important notes!

This range – identified by G for GOLD NUGGET SEED® as the second letter in the item number – listed on this page and the following, no longer needs a period of low temperature to break dormancy. Depending on the variety, the seeds will germinate evenly and promptly 14 to 21 days after sowing. (Untreated seed would need two to six months).

The advantage is obvious – a shorter and more controlled growing period with more productive results! JELITTO GOLD NUGGET SEED® are also particularly suitable for sowing direct into cells so that subsequent pricking out can be dispensed with. They require only about half the amount of seed that would be required with untreated seed.

The minimum germination standard of GOLD NUGGET SEED® is >75%, respectively >88% under controlled conditions. Nevertheless, in order to obtain best possible results, we do recommend a multiplication factor of 2 or 3 when calculating seed requirements (3000 seeds for 1000 plants, 2-3 seeds per plant).

You can proceed according to our Sowing Instructions No. 15 or 16. Ideal germination temperature: 22°C (72°F). After germination, the seedlings must be kept cool (+5 to 10°C)(41 to 50°F) in the months with less daylight hours, but must not be exposed to frost. At this time, it is of great benefit if the seedlings can receive at least 8 – 12 hours of light per day. This requires additional lighting in the winter months.

Uncontrolled high temperatures during the summer months can have a deleterious effect on successful germination.

Some species germinate very fast without a cold treatment but need to be sown immediately after harvest. For example *Primula rosea* and *Pulsatilla vulgaris*.

JELITTO GOLD NUGGET SEED® is typified with 2% golden coloured seeds.

Please note that JELITTO GOLD NUGGET SEED® "pre-treated seed" should not be stored and should be used as soon as possible after receipt. JELITTO GOLD NUGGET SEED® should be kept in a cool place until it is used.

**Please order Gold Nugget Seed® in number of seeds only. There are no 1000 seed units prepacked! Each order is weighed individually. You are welcome to order any amount, ie. 700 seeds or 15200 seeds. Please bear in mind our minimum quantity per item. Minimum charge per item 2 € net, price will be rounded up accordingly.**

The price per 1000 seed is a fixed price for this number of seeds, while the quantity in weight may vary considerably between different seed lots. The number of seed per gram is counted for each seed lot individually. Seeds are measured according to weight and are not counted each time for every order. Therefore, the number of seed may vary and a ± difference of approx. 5% should be accepted with no compensation in any way due the technical circumstances.

		Prices in EURO net per 1000 seeds	Minimum order quantity/ seeds	Nº. of the sowing directions	Special Hints	Code Nº
AG 019	ACAENA inermis 'Purpurea'	24,00	100	16	germinates after 5-6 weeks at +26°C	AG 019
AG 005	ACAENA microphylla	12,00	200	16	germinates after 5-6 weeks at +26°C	AG 005
AG 070	ACONITUM anthora	18,00	150	15	germinating in 4-6 weeks at 24°C days, 15°C nights	AG 070
AG 090	ACONITUM napellus	22,00	100	15	germinating in 4-6 weeks at 24°C days, 15°C nights	AG 090
AG 094	ACONITUM napellus 'Newry Blue'	24,00	100	16	germinating in 4-6 weeks at 24°C days, 15°C nights	AG 094
AG 103	ACORUS calamus	22,00	100	16	requires 4-6 weeks for germination	AG 103
AG 132	AETHIONEMA grandiflorum (pulchellum)	24,00	100	15	germination occurs in 1-2 weeks	AG 132
AG 280	ALCEA (ALTHAEA) Ficifolia-Hybr. [Happy Lights]	18,00	150	15	varying temperatures beneficial, day 24°C, night 15°C	AG 280
AG 285	ALCEA (ALTHAEA) Ficifolia-Hybr. 'Las Vegas'	22,00	100	15	varying temperatures beneficial, day 24°C, night 15°C	AG 285
AG 286	ALCEA (ALTHAEA) Rosea-Hybr. 'Simplex'	18,00	150	15	varying temperatures beneficial, day 24°C, night 15°C	AG 286
AG 310	ALCEA (ALTHAEA) rugosa	18,00	150	15	varying temperatures beneficial, day 24°C, night 15°C	AG 310
AG 163	ALCHEMILLA epipsila	12,00	200	16	light-germinator, do not cover	AG 163
AG 164	ALCHEMILLA erythropoda [Alma]	12,00	200	15	light-germinator, do not cover	AG 164
AG 167	ALCHEMILLA mollis [Thriller, Irish Silk]	2,40	1000	15	light-germinator, do not cover	AG 167
AG 168	ALCHEMILLA mollis 'Select' [Robustica, Giant Molly]	3,60	500	15	light-germinator, do not cover	AG 168
AG 174	ALCHEMILLA sericata 'Gold Strike'	12,00	200	15	light-germinator, do not cover	AG 174
AG 178	ALCHEMILLA xanthochlora (vulgaris)	2,40	1000	16	light-germinator, do not cover	AG 178
AG 365	AMSONIA hubrichtii	72,00	100	15		AG 365
AG 366	AMSONIA tabernaemontana [Stars, Blue Star]	54,00	100	15		AG 366
AG 412	ANDROSACE villosa	128,00	50	16	requires 4-6 weeks for germination	AG 412
AG 444	ANEMONE hupehensis (japonica)	12,00	200	15		AG 444
AG 460	ANEMONE multifida 'Major' [Annabella White]	12,00	200	15		AG 460
AG 448	ANEMONE multifida 'Rubra' [Annabella Deep Pink]	12,00	200	15		AG 448
AG 544	ANTHYLLIS vulneraria var. coccinea [Red Carpet]	28,00	100	15	germination occurs in 1-2 weeks	AG 544
AG 601	AQUILEGIA buergeriana 'Calimero' [Blackcurrant Ice]	18,00	150	16		AG 601
AG 764	AQUILEGIA flabellata var. pumila 'Selection'	18,00	150	15		AG 764
AG 852	ARENARIA montana [Avalanche, Snowwhite]	24,00	100	15	requires 4-6 weeks for germination	AG 852
AG 944	ARUNCUS aethusifolius [Noble Spirit]	3,60	500	15		AG 944
NEW! AG 952	ARUNCUS dioicus	2,40	500	16	varying temperatures, night 18°C, day 26°C, of benefit	AG 952
AG 976	ASCLEPIAS incarnata [Soulmate, Cinderella]	22,00	100	15		AG 976
AG 977	ASCLEPIAS incarnata 'Iceballet' [Milkmaid, Ice Follies]	22,00	100	15		AG 977
AG 985	ASCLEPIAS tuberosa ssp. interior	32,00	100	15		AG 985
AG 988	ASCLEPIAS tuberosa 'Gay Butterflies'	42,00	100	15		AG 988
AG 014	ASPHODELINE lutea [Gelbe Kerze, Yellow Candle]	72,00	50	15	dark-germinator, must be covered	AG 014
BG 015	BAPTISIA australis [Caspian Blue]	58,00	50	15		BG 015
BG 012	BAPTISIA australis 'Alba'	284,00	50	15		BG 012
BG 017	BAPTISIA leucantha (lactea, alba var. macrophylla)	104,00	50	16	germinating in 4-6 weeks at 24°C days, 15°C nights	BG 017
BG 020	BAPTISIA pendula (alba)	162,00	50	15		BG 020
NEW! CG 020	CALAMINTHA grandiflora [Elfin Purple]	24,00	100	16	varying temperatures, night 18°C, day 26°C, of benefit	CG 020
CG 038	CALLIRHOE involucreta [Winecups, Buffalo Rose]	72,00	50	16	requires 4-6 weeks for germination	CG 038
CG 043	CALTHA leptosepala	24,00	100	15		CG 043
CG 044	CALTHA palustris	12,00	200	15		CG 044
NEW! CG 045	CALTHA palustris var. alba	32,00	100	15		CG 045
CG 104	CAMPANULA collina	6,00	400	15		CG 104
CG 116	CAMPANULA garganica	7,20	300	15	dark-germinator, must be covered	CG 116
CG 158	CAMPANULA latifolia var. macrantha [Amethyst]	4,20	500	15		CG 158

JELITTO GOLD NUGGET SEED®

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	Prices in EURO net per 1000 seeds	Minimum order quantity/ seeds	N° of the sowing directions	Special Hints	Code N°
CG 162	4,20	500	15		CG 162
CG 190	12,00	300	15	dark-germinator, must be covered.	CG 190
CG 194	6,00	400	15		CG 194
CG 200	2,40	1000	15		CG 200
CG 370	18,00	150	15	varying temperatures beneficial, day 24°C, night 15°C	CG 370
CG 372	18,00	150	15	varying temperatures beneficial, day 24°C, night 15°C	CG 372
CG 374	18,00	150	15	varying temperatures beneficial, day 24°C, night 15°C	CG 374
CG 375	18,00	150	15	varying temperatures beneficial, day 24°C, night 15°C	CG 375
CG 378	3,60	1000	15	germinates after 5-6 weeks at +26°C.	CG 378
CG 542	12,00	200	15		CG 542
CG 584	9,80	300	15		CG 584
CG 629	4,20	500	15		CG 629
CG 690	72,00	50	16	dark-germinator, must be covered, allow 5-6 weeks	CG 690
CG 695	162,00	50	16	dark-germinator, must be covered, allow 5-6 weeks	CG 695
CG 692	72,00	50	16	requires 4-6 weeks for germination.	CG 692
CG 694	162,00	50	16	requires 4-6 weeks for germination.	CG 694
CG 698	162,00	50	16	requires 4-6 weeks for germination.	CG 698
CG 700	162,00	50	16	dark-germinator, must be covered, allow 5-6 weeks	CG 700
DG 420	12,00	200	15	varying temperatures beneficial, day 24°C, night 15°C	DG 420
DG 422	72,00	100	15	varying temperatures beneficial, day 24°C, night 15°C	DG 422
DG 423	12,00	200	15	varying temperatures beneficial, day 24°C, night 15°C	DG 423
DG 424	24,00	100	15	varying temperatures beneficial, day 24°C, night 15°C	DG 424
DG 421	12,00	200	15	varying temperatures beneficial, day 24°C, night 15°C	DG 421
DG 425	36,00	100	15	varying temperatures beneficial, day 24°C, night 15°C	DG 425
DG 426	36,00	100	15	varying temperatures beneficial, day 24°C, night 15°C	DG 426
DG 480	64,00	50	15		DG 480
DG 482	64,00	50	15		DG 482
EG 003	24,00	100	15	germination occurs in 1-2 weeks	EG 003
EG 005	24,00	100	15		EG 005
EG 006	24,00	100	15	germination occurs in 1-2 weeks	EG 006
EG 007	24,00	100	15		EG 007
EG 008	24,00	100	15		EG 008
EG 130	98,00	50	16	requires 4-6 weeks for germination.	EG 130
EG 202	5,40	400	15		EG 202
EG 206	5,40	400	15		EG 206
EG 212	5,40	400	15		EG 212
EG 250	98,00	50	15	varying temperatures beneficial, day 24°C, night 15°C	EG 250
EG 226	32,00	100	15	varying temperatures beneficial, day 24°C, night 15°C	EG 226
EG 236	58,00	50	15	varying temperatures beneficial, day 24°C, night 15°C	EG 236
EG 240	32,00	100	15	varying temperatures beneficial, day 24°C, night 15°C	EG 240
FG 018	5,40	400	15		FG 018
GG 051	7,20	300	16	requires 4-6 weeks for germination.	GG 051
GG 070	12,00	200	15	requires 4-6 weeks for germination.	GG 070
GG 083	18,00	200	15	requires 4-6 weeks for germination.	GG 083
GG 086	7,20	300	15		GG 086
GG 090	7,20	300	15		GG 090
GG 088	18,00	300	15		GG 088
GG 102	18,00	200	15	requires 4-6 weeks for germination.	GG 102
GG 099	6,00	400	15		GG 099
GG 114	18,00	200	16	requires 4-6 weeks for germination.	GG 114
GG 134	6,00	400	15		GG 134
GG 138	7,20	500	15		GG 138
GG 148	48,00	200	15		GG 148
GG 151	7,20	500	15		GG 151
GG 172	3,60	500	15	germination occurs in 1-2 weeks	GG 172
NEW! GG 174	5,40	500	15	germination occurs in 1-2 weeks	GG 174
GG 173	5,40	500	15	germination occurs in 1-2 weeks	GG 173
GG 190	4,20	500	15		GG 190
NEW! GG 197	16,00	200	15		GG 197



TROLLIUS chinensis 'Golden Queen'  
germination comparison: untreated to JELITTO GOLD NUGGET SEED®

VIOLA sororia 'Freckles'  
germination comparison: untreated to JELITTO GOLD NUGGET SEED®

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GG 195	<b>GENTIANA</b> verna var. angulosa 'Alba' . . . . .	18,00	200	15		GG 195
GG 198	<b>GENTIANA</b> verna ssp. tergestina . . . . .	12,00	200	15	requires 4-6 weeks for germination. . . . .	GG 198
GG 204	<b>GERANIUM</b> bohemicum [ <i>Orchid Blue, Blue Rhapsody</i> ] . . . . .	64,00	50	15		GG 204
GG 210	<b>GERANIUM</b> endressii . . . . .	64,00	50	15		GG 210
GG 215	<b>GERANIUM</b> macrorrhizum, wild form . . . . .	52,00	50	16		GG 215
GG 256	<b>GERANIUM</b> maderense 'Guernsey White' . . . . .	240,00	50	15		GG 256
GG 209	<b>GERANIUM</b> palustre . . . . .	64,00	50	15		GG 209
GG 218	<b>GERANIUM</b> pratense . . . . .	64,00	50	15		GG 218
GG 227	<b>GERANIUM</b> pratense f. albiflorum . . . . .	128,00	50	15		GG 227
GG 231	<b>GERANIUM</b> pratense 'Dark Reiter' . . . . .	240,00	50	15	germination occurs in 1-2 weeks . . . . .	GG 231
GG 232	<b>GERANIUM</b> pratense 'Mrs. Kendall Clark' . . . . .	128,00	50	15		GG 232
GG 237	<b>GERANIUM</b> pratense 'Painter's Palette' . . . . .	64,00	50	15		GG 237
GG 229	<b>GERANIUM</b> pratense 'Striatum' [ <i>Spish-Splash, Bicolor</i> ] . . . . .	128,00	50	15	germination occurs in 1-2 weeks . . . . .	GG 229
GG 219	<b>GERANIUM</b> pyrenaicum 'Bill Wallis' . . . . .	48,00	50	15		GG 219
GG 222	<b>GERANIUM</b> sanguineum [ <i>Vision Violet</i> ] . . . . .	125,00	50	16		GG 222
GG 223	<b>GERANIUM</b> sanguineum f. nanum . . . . .	240,00	50	15		GG 223
GG 205	<b>GERANIUM</b> sanguineum var. striatum [ <i>Vision Light Pink</i> ] . . . . .	125,00	50	15		GG 205
GG 226	<b>GERANIUM</b> sylvaticum . . . . .	64,00	50	15		GG 226
GG 234	<b>GERANIUM</b> waltichianum 'Buxton's Variety' . . . . .	240,00	50	15		GG 234
GG 243	<b>GERANIUM</b> wlassovianum . . . . .	128,00	50	15	requires 4-6 weeks for germination. . . . .	GG 243
GG 240	<b>GEUM</b> coccineum Borisii-Strain [ <i>Tango, Queen of Orange, Cookie</i> ] . . . . .	18,00	100	15	varying temperatures, night 18°C, day 26°C, of benefit. . . . .	GG 240
GG 241	<b>GEUM</b> coccineum 'Koi' . . . . .	28,00	100	15	varying temperatures, night 18°C, day 26°C, of benefit. . . . .	GG 241
GG 266	<b>GILLENIA</b> trifoliata . . . . .	72,00	50	16	requires 4-6 weeks for germination. . . . .	GG 266
GG 296	<b>GLECHOMA</b> hederacea . . . . .	4,20	500	16		GG 296
GG 317	<b>GLYCYRRHIZA</b> glabra . . . . .	72,00	50	15	germination occurs in 1-2 weeks . . . . .	GG 317
GG 336	<b>GYPSOPHILA</b> cerastioides [ <i>Pixie Splash</i> ] . . . . .	18,00	100	15	germination occurs in 1-2 weeks . . . . .	GG 336
HG 052	<b>HELIANTHEMUM</b> nummularium [ <i>Evergreen</i> ] . . . . .	7,20	300	15	germination occurs in 1-2 weeks . . . . .	HG 052
HG 181	<b>HEUCHERA</b> americana 'Dale's Strain' . . . . .	2,40	1000	15		HG 181
HG 186	<b>HEUCHERA</b> americana 'Palace Purple Select' . . . . .	2,40	1000	15		HG 186
HG 189	<b>HEUCHERA</b> pulchella . . . . .	2,40	1000	15		HG 189
HG 196	<b>HEUCHERA</b> sanguinea 'Leuchtkäfer' [ <i>Firefly</i> ] . . . . .	2,40	1000	15		HG 196
HG 197	<b>HEUCHERA</b> sanguinea 'White Cloud' . . . . .	2,40	1000	15		HG 197
HG 190	<b>HEUCHERA</b> villosa var. macrorrhiza [ <i>Autumn Bride</i> ] . . . . .	2,40	1000	15		HG 190
HG 208	<b>HIBISCUS</b> coccineus . . . . .	72,00	50	15	dark-germinator, must be covered. . . . .	HG 208
HG 205	<b>HIBISCUS</b> manihot [ <i>Sunset</i> ] . . . . .	72,00	50	15	dark-germinator, must be covered. . . . .	HG 205
HG 210	<b>HIBISCUS</b> moscheutos (palustris) . . . . .	42,00	50	15	dark-germinator, must be covered. . . . .	HG 210
HG 212	<b>HIBISCUS</b> Moscheutos-Hybr. 'Galaxy' . . . . .	72,00	50	15	dark-germinator, must be covered. . . . .	HG 212
HG 280	<b>HUMULUS</b> lupulus . . . . .	24,00	100	15		HG 280
HG 314	<b>HYPERICUM</b> calycinum [ <i>Rose of Sharon</i> ] . . . . .	12,00	200	15	varying temperatures, night 18°C, day 26°C, of benefit. . . . .	HG 314
HG 316	<b>HYPERICUM</b> cerastoides (rhodophaeum) [ <i>Silvana</i> ] . . . . .	12,00	200	15	varying temperatures, night 18°C, day 26°C, of benefit. . . . .	HG 316
IG 004	<b>IBERIS</b> aurosica 'Sweetheart' . . . . .	24,00	100	15	varying temperatures beneficial, day 24°C, night 15°C . . . . .	IG 004
IG 024	<b>IBERIS</b> sempervirens 'Snow Cushion' . . . . .	12,00	200	15	varying temperatures beneficial, day 24°C, night 15°C . . . . .	IG 024
IG 114	<b>IRIS</b> setampferi (ensata) . . . . .	28,00	100	16	requires 4-6 weeks for germination. . . . .	IG 114
IG 160	<b>IRIS</b> setosa ssp. canadensis (artica, hookeri, nana) . . . . .	36,00	50	16	temperature +28°C beneficial . . . . .	IG 160
KG 037	<b>KNIPHOFIA</b> caulescens . . . . .	24,00	100	16	requires 4-6 weeks for germination. . . . .	KG 037
KG 041	<b>KNIPHOFIA</b> hirsuta 'Fire Dance' [ <i>Traffic Lights</i> ] . . . . .	24,00	100	15	dark-germinator, must be covered, allow 5-6 weeks. . . . .	KG 041
KG 043	<b>KNIPHOFIA</b> rooperi . . . . .	24,00	100	15		KG 043
LG 042	<b>LATHYRUS</b> latifolius 'Pink Pearl' . . . . .	42,00	50	15	varying temperatures beneficial, day 24°C, night 15°C . . . . .	LG 042
LG 044	<b>LATHYRUS</b> latifolius 'Red Pearl' . . . . .	42,00	50	15	varying temperatures beneficial, day 24°C, night 15°C . . . . .	LG 044
LG 046	<b>LATHYRUS</b> latifolius 'White Pearl' . . . . .	42,00	50	15	varying temperatures beneficial, day 24°C, night 15°C . . . . .	LG 046
LG 058	<b>LATHYRUS</b> vernus . . . . .	84,00	50	16	requires 4-6 weeks for germination. . . . .	LG 058
LG 070	<b>LAVANDULA</b> angustifolia (officinalis) . . . . .	3,60	500	15		LG 070
LG 074	<b>LAVANDULA</b> angustifolia Hidcote Blue-Strain . . . . .	5,40	500	15		LG 074
LG 076	<b>LAVANDULA</b> angustifolia 'Hidcote Superior' . . . . .	6,20	500	15		LG 076
LG 078	<b>LAVANDULA</b> angustifolia Munstead-Strain . . . . .	3,60	500	15		LG 078
LG 080	<b>LAVANDULA</b> angustifolia 'Rosea' [ <i>Pink Perfume</i> ] . . . . .	9,80	500	15		LG 080
LG 082	<b>LAVANDULA</b> latifolia (spica) . . . . .	6,20	500	15		LG 082
LG 086	<b>LAVANDULA</b> stoechas . . . . .	9,80	500	15		LG 086
LG 089	<b>LAVATERA</b> cachemiriana . . . . .	24,00	100	15		LG 089
LG 090	<b>LAVATERA</b> thuringiaca . . . . .	24,00	100	15		LG 090
LG 124	<b>LEWISIA</b> Cotyledon-Hybr. 'Regenbogen' [ <i>Rainbow</i> ] . . . . .	72,00	100	16	varying temperatures beneficial, day 24°C, night 15°C . . . . .	LG 124
NEW! LG 131	<b>LEWISIA</b> Cotyledon-Hybr. 'Sunset-Strain' . . . . .	48,00	100	16	varying temperatures beneficial, day 24°C, night 15°C . . . . .	LG 131
LG 145	<b>LEWISIA</b> Longipetala-Hybr. 'Little Mango' . . . . .	72,00	100	16	varying temperatures beneficial, day 24°C, night 15°C . . . . .	LG 145
LG 140	<b>LEWISIA</b> Longipetala-Hybr. 'Little Peach' . . . . .	72,00	100	16	varying temperatures beneficial, day 24°C, night 15°C . . . . .	LG 140
LG 135	<b>LEWISIA</b> Longipetala-Hybr. 'Little Plum' . . . . .	72,00	100	16	varying temperatures beneficial, day 24°C, night 15°C . . . . .	LG 135
LG 147	<b>LEWISIA</b> Longipetala-Hybr. 'Little Raspberry' . . . . .	72,00	100	16	varying temperatures beneficial, day 24°C, night 15°C . . . . .	LG 147
NEW! LG 148	<b>LEWISIA</b> Longipetala-Hybr. 'Little Snowberry' . . . . .	72,00	100	16	varying temperatures beneficial, day 24°C, night 15°C . . . . .	LG 148
LG 149	<b>LEWISIA</b> Longipetala-Hybr. 'Little Tutti Frutti' . . . . .	72,00	100	16	varying temperatures beneficial, day 24°C, night 15°C . . . . .	LG 149
LG 292	<b>LINARIA</b> purpurea . . . . .	2,40	1000	15		LG 292
LG 296	<b>LINARIA</b> purpurea 'Canon Went' . . . . .	2,40	1000	15		LG 296
LG 294	<b>LINARIA</b> purpurea 'Springside White' . . . . .	2,40	1000	15		LG 294
LG 322	<b>LINUM</b> capitatum [ <i>Sulphur</i> ] . . . . .	28,00	100	15		LG 322
LG 331	<b>LINUM</b> hypericifolium . . . . .	28,00	100	15		LG 331
LG 332	<b>LINUM</b> narbonense [ <i>Heavenly Blue</i> ] . . . . .	28,00	100	15		LG 332
LG 370	<b>LOBELIA</b> cardinalis . . . . .	3,60	500	16	varying temperatures, night 18°C, day 26°C, of benefit. . . . .	LG 370
LG 373	<b>LOBELIA</b> sessilifolia . . . . .	12,00	200	15		LG 373
LG 379	<b>LOBELIA</b> siphilitica 'Alba' . . . . .	2,40	1000	15		LG 379
LG 378	<b>LOBELIA</b> siphilitica 'Blue Selection' . . . . .	2,40	1000	15		LG 378
NEW! LG 522	<b>LYSIMACHIA</b> clethroides [ <i>Lady Jane</i> ] . . . . .	36,00	100	15		LG 522

 JELITTO  
GOLD NUGGET SEED®



RUDBECKIA fulgida var. sullivanti 'Goldsturm'  
germination comparison: untreated to JELITTO GOLD NUGGET SEED®



RUDBECKIA fulgida var. sullivanti 'Goldsturm'  
germination comparison: untreated to JELITTO GOLD NUGGET SEED®

		Prices in EURO net per 1000 seeds	Minimum order quantity/ seeds	Nº. of the sowing directions	Special Hints	Code Nº
	LG 524	3,60	500	15		LG 524
	LG 527	2,40	500	15		LG 527
<b>NEW!</b>	LG 530	2,40	1000	16	varying temperatures, night 18°C, day 26°C, of benefit.	LG 530
	MG 030	9,80	200	15		MG 030
	MG 034	5,40	400	15		MG 034
	MG 038	5,40	400	15		MG 038
	MG 039	5,40	400	15		MG 039
	MG 043	9,80	200	15	germination occurs in 1-2 weeks	MG 043
	MG 041	9,80	200	15	germination occurs in 1-2 weeks	MG 041
	MG 060	18,00	100	15	varying temperatures beneficial, day 24°C, night 15°C	MG 060
	MG 062	24,00	100	15	varying temperatures beneficial, day 24°C, night 15°C	MG 062
	MG 063	24,00	100	15	varying temperatures beneficial, day 24°C, night 15°C	MG 063
	MG 066	7,20	300	15	varying temperatures beneficial, day 24°C, night 15°C	MG 066
	MG 075	24,00	100	15	varying temperatures beneficial, day 24°C, night 15°C	MG 075
	MG 072	24,00	100	15	varying temperatures beneficial, day 24°C, night 15°C	MG 072
	MG 067	48,00	100	15	varying temperatures beneficial, day 24°C, night 15°C	MG 067
	OG 026	16,00	150	15	germination occurs in 1-2 weeks	OG 026
	OG 027	32,00	100	15	germination occurs in 1-2 weeks	OG 027
	OG 028	32,00	100	15	germination occurs in 1-2 weeks	OG 028
	OG 062	32,00	100	15		OG 062
	PG 200	32,00	100	16	requires 4-6 weeks for germination.	PG 200
<b>NEW!</b>	PG 208	3,60	300	15	germination occurs in 1-2 weeks	PG 208
	PG 209	6,20	300	15	germination occurs in 1-2 weeks	PG 209
	PG 218	16,00	150	16	requires 4-6 weeks for germination.	PG 218
	PG 219	32,00	100	15		PG 219
	PG 222	6,20	300	15		PG 222
	PG 224	6,20	300	15		PG 224
	PG 229	3,60	500	15		PG 229
	PG 231	3,60	500	15		PG 231
	PG 221	32,00	100	15		PG 221
	PG 236	6,20	300	15		PG 236
	PG 204	6,20	300	15		PG 204
	PG 250	3,60	500	15		PG 250
	PG 256	3,60	500	15		PG 256
	PG 252	6,20	300	16	requires 4-6 weeks for germination.	PG 252
	PG 258	6,20	300	15		PG 258
	PG 280	12,00	200	15		PG 280
	PG 287	72,00	50	16		PG 287
	PG 290	72,00	50	16	requires 4-6 weeks for germination.	PG 290
	PG 294	42,00	200	15		PG 294
	PG 334	12,00	200	15	germination occurs in 1-2 weeks	PG 334
	PG 360	12,00	200	15		PG 360
<b>NEW!</b>	PG 479	16,00	150	16	varying temperatures beneficial, day 24°C, night 15°C	PG 479
	PG 560	16,00	200	16		PG 560
	PG 742	24,00	200	15	varying temperatures beneficial, day 24°C, night 15°C	PG 742
	PG 750	7,20	500	15	varying temperatures beneficial, day 24°C, night 15°C	PG 750
	PG 758	4,20	500	15	varying temperatures beneficial, day 24°C, night 15°C	PG 758
	PG 754	7,20	500	15	varying temperatures beneficial, day 24°C, night 15°C	PG 754
	PG 772	7,20	500	15	varying temperatures beneficial, day 24°C, night 15°C	PG 772
	PG 774	7,20	500	15	varying temperatures beneficial, day 24°C, night 15°C	PG 774
	PG 804	7,20	500	15	varying temperatures beneficial, day 24°C, night 15°C	PG 804
	PG 808	7,20	500	15	varying temperatures beneficial, day 24°C, night 15°C	PG 808
	PG 844	4,20	500	15	varying temperatures beneficial, day 24°C, night 15°C	PG 844
	PG 846	4,20	500	15	varying temperatures beneficial, day 24°C, night 15°C	PG 846
	PG 847	4,20	500	15	varying temperatures beneficial, day 24°C, night 15°C	PG 847
	PG 850	4,20	500	15	varying temperatures beneficial, day 24°C, night 15°C	PG 850
	PG 868	12,00	300	15	varying temperatures beneficial, day 24°C, night 15°C	PG 868
	PG 872	12,00	300	15	varying temperatures beneficial, day 24°C, night 15°C	PG 872

	Prices in EURO net per 1000 seeds	Minimum order quantity/ seeds	N° of the sowing directions	Special Hints	Code N°
PG 874	12,00	300	15	varying temperatures beneficial, day 24°C, night 15°C	PG 874
<b>NEW!</b> PG 878	16,00	150	16	varying temperatures beneficial, day 24°C, night 15°C	PG 878
PG 880	24,00	100	16	varying temperatures beneficial, day 24°C, night 15°C	PG 880
PG 884	7,20	500	15	varying temperatures beneficial, day 24°C, night 15°C	PG 884
PG 890	4,20	500	15	varying temperatures beneficial, day 24°C, night 15°C	PG 890
PG 896	12,00	300	15	varying temperatures beneficial, day 24°C, night 15°C	PG 896
PG 898	24,00	200	16	varying temperatures beneficial, day 24°C, night 15°C	PG 898
PG 902	7,20	500	15	varying temperatures beneficial, day 24°C, night 15°C	PG 902
PG 910	3,60	500	15	varying temperatures beneficial, day 24°C, night 15°C	PG 910
PG 916	24,00	100	15	varying temperatures beneficial, day 24°C, night 15°C	PG 916
PG 926	32,00	100	15	germinating in 4-6 weeks at 24°C days, 15°C nights	PG 926
PG 927	64,00	100	15	germinating in 4-6 weeks at 24°C days, 15°C nights	PG 927
PG 986	24,00	100	15	requires 4-6 weeks for germination.	PG 986
PG 988	16,00	150	15	requires 4-6 weeks for germination.	PG 988
PG 990	16,00	150	15	requires 4-6 weeks for germination.	PG 990
PG 989	16,00	150	15	requires 4-6 weeks for germination.	PG 989
PG 980	16,00	150	15	requires 4-6 weeks for germination.	PG 980
PG 991	16,00	150	15	requires 4-6 weeks for germination.	PG 991
PG 992	16,00	150	15	requires 4-6 weeks for germination.	PG 992
<b>NEW!</b> PG 800	16,00	150	15	requires 4-6 weeks for germination.	PG 800
RG 036	48,00	50	16	requires 4-6 weeks for germination.	RG 036
RG 090	7,20	500	15		RG 090
RG 130	16,00	150	15		RG 130
RG 160	12,00	200	15	light-germinator, do not cover, night 18°C, day 26°C.	RG 160
RG 162	12,00	200	16	light-germinator, do not cover, night 18°C, day 26°C.	RG 162
RG 190	12,00	200	15	light-germinator, do not cover, night 18°C, day 26°C.	RG 190
RG 164	7,20	300	15	light-germinator, do not cover, night 18°C, day 26°C.	RG 164
RG 173	12,00	200	16	light-germinator, do not cover, night 18°C, day 26°C.	RG 173
RG 202	148,00	50	15		RG 202
SG 150	12,00	200	15		SG 150
SG 144	12,00	200	15		SG 144
SG 152	92,00	50	15		SG 152
SG 400	3,60	500	15	germination occurs in 1-2 weeks	SG 400
SG 432	16,00	150	15		SG 432
SG 434	18,00	150	15		SG 434
SG 436	7,20	300	15		SG 436
SG 437	18,00	150	15		SG 437
SG 510	16,00	150	16	requires 4-6 weeks for germination.	SG 510
SG 511	16,00	150	16	requires 4-6 weeks for germination.	SG 511
SG 522	24,00	100	15	requires 4-6 weeks for germination.	SG 522
SG 534	24,00	100	15	requires 4-6 weeks for germination.	SG 534
SG 560	24,00	100	15	requires 4-6 weeks for germination.	SG 560
SG 562	48,00	100	15	requires 4-6 weeks for germination.	SG 562
SG 610	48,00	50	15		SG 610
SG 611	72,00	50	15		SG 611
TG 020	2,40	1000	15		TG 020
TG 088	54,00	50	15		TG 088
TG 096	28,00	50	15		TG 096
TG 098	54,00	50	15		TG 098
TG 138	12,00	200	16	requires 4-6 weeks for germination.	TG 138
TG 140	12,00	200	16	requires 4-6 weeks for germination.	TG 140
TG 190	12,00	200	15		TG 190
TG 192	24,00	100	15		TG 192
TG 194	24,00	100	15		TG 194
TG 240	12,00	200	15		TG 240
TG 242	36,00	100	16		TG 242
TG 244	36,00	100	15		TG 244
TG 248	12,00	200	15		TG 248
TG 256	12,00	200	15		TG 256
TG 257	36,00	100	15		TG 257
TG 258	24,00	100	16		TG 258
TG 260	24,00	100	15		TG 260
VG 100	6,20	500	15	varying temperatures, night 18°C, day 26°C, of benefit.	VG 100
VG 112	6,20	500	15	varying temperatures, night 18°C, day 26°C, of benefit.	VG 112
VG 113	6,20	500	15	varying temperatures, night 18°C, day 26°C, of benefit.	VG 113
VG 114	6,20	500	15	varying temperatures, night 18°C, day 26°C, of benefit.	VG 114
VG 120	12,00	200	15	requires 4-6 weeks for germination.	VG 120
VG 124	12,00	200	15	requires 4-6 weeks for germination.	VG 124
VG 191	3,60	600	15		VG 191
VG 180	3,60	600	15		VG 180
VG 262	12,00	200	15	requires 4-6 weeks for germination.	VG 262
VG 234	24,00	100	16	requires 4-6 weeks for germination.	VG 234
VG 246	18,00	150	15	requires 4-6 weeks for germination.	VG 246
VG 252	18,00	150	15	requires 4-6 weeks for germination.	VG 252
VG 248	18,00	150	15	requires 4-6 weeks for germination.	VG 248
VG 247	18,00	150	15	requires 4-6 weeks for germination.	VG 247
VG 263	12,00	200	15	requires 4-6 weeks for germination.	VG 263
ZG 004	24,00	100	15		ZG 004

1. Kaltkeimer werden auch heute noch, nicht ganz zutreffend, Frostkeimer genannt.  
Die Aussaat muß während der ersten 2–4 Wochen **warm** (ca. +18 bis +22°C) und gut feucht gehalten werden. Danach ist sie für etwa 4–6 Wochen einer kalten Temperatur zwischen –4 und +4°C auszusetzen. Lediglich bei den meisten Ranunkelgewächsen sind Temperaturen um –5°C von Vorteil.  
Sollten die hier genannten Temperaturen während der Kühlperiode über- oder unterschritten werden, schadet dies nicht, jedoch muß die Kühlperiode dann entsprechend verlängert werden, da der Aufbauprozess der keimauslösenden, hormonartigen Säure während dieser Zeit sich verlangsamt hatte oder still stand.  
Kann man die Aussaaten in der Kühlperiode mit Schnee bedecken, ist das von Vorteil. Die Temperatur darunter hält sich meistens in dem günstigen Bereich von –4 bis 0°C, es bleibt feucht, und der schmelzende Schnee „frißt“ an der Samenschale, macht diese poröser, was beim Ausschleiben des Keimes von Vorteil ist. Nach dieser Kühlperiode dürfen keinesfalls sofort hohe Temperaturen angewandt werden, vielmehr liegt dann der günstigste Temperaturbereich zwischen +5 und +12°C, auch dann, wenn bereits eine Keimung zu beobachten ist! Also ist der richtige Platz für diese Aussaaten, auch im März/April/Mai noch, das Freiland, der kalte Kasten oder ein Kaltthaus.
2. Die Mehrzahl der Ranunkel-Gewächse benötigt tiefere Temperaturen in der Kühlperiode, ca. –5°C, sonst wie in 1.) beschrieben verfahren. Der Grund liegt wahrscheinlich darin, daß der Gefrierpunkt dieser Samen bei ca. –7°C liegt, bei den meisten anderen Samen aber bei –5°C.
3. Diese Arten bringen meist ein ausgezeichnetes Keimergebnis, wenn sie bald nach der Ernte ausgesät werden, obwohl bei vielen dieser Arten die Keimung selbst dann erst im Frühjahr, nach Wintereinwirkung, erfolgt. Deshalb diese Samen rechtzeitig bestellen.
4. Hier handelt es sich um sehr feine Samen, die man für eine gleichmäßige Aussaat eventuell mit Talkum oder feinstem Sand mischen sollte. Nicht mit Erde übersieben, nur andrücken. Bewässerung von unten oder mit feinem Zerstäuber, damit die Samen nicht weggeschwemmt werden.
5. Nicht immer führt das unter 1.) beschriebene Verfahren zu einem vollen Erfolg. Manche Arten benötigen nach der Kühlperiode noch zusätzlich eine längere Zeit bis zur Keimung. Saatgefäße daher nicht zu früh wegwerfen. Manche Samen liegen dann noch ein ganzes Jahr.
6. Diese Samen liegen sehr lange bis zur Keimung, 1 Jahr und mehr. Aus Platzgründen, und auch um das Austrocknen zu verhindern, wird dieser Samen „stratifiziert“. Das bedeutet: Einschichten der Samen in feuchten Sand. Abwechselnd eine Schicht gut feuchten Sand, eine dünne Schicht Samen usw. Die Stratifizierkisten setzt man an schattiger Stelle den Witterungseinflüssen (besonders dem Winterwetter) aus und schützt durch feines Drahtgeflecht vor Mäusen und Vögeln. Für größere Saatgutmengen haben sich in Anzuchtbaumschulen betonierete Stratifizierkästen bewährt. Im Frühjahr sollte öfters kontrolliert werden, ob die Keimung bereits beginnt. Dann sofort mit dem Sand, der ständig feucht gehalten wurde, auf das vorbereitete Saatbeet ausbringen.
7. Dieser Samen sollte so dick abgedeckt werden, wie der Durchmesser des Samenkorns ist. Bei Tagestemperaturen um +20°C stets für gleichmäßige Feuchtigkeit sorgen, für Cyclamen ist +18°C jedoch besser. Nach erfolgter Keimung hell und mäßig warm aufstellen.
8. Es handelt sich hier um Staudensamen, der sehr ungleichmäßig keimt auf eine lange Keimperiode verteilt. Hier sind auch besonders Einwirkungen von niederen Temperaturen unter +5°C sehr von Vorteil. Saatgefäße nicht zu früh vernichten. Besonders auf gleichmäßige Feuchtigkeit achten und keiner direkten Sonnenbestrahlung aussetzen. Für Astromeria empfehlen wir, die Aussaat 21 Tage bei ca. +30°C aufzustellen. Danach 21 Tage bei +5°C, anschließend ca. +21°C.
9. Keimt je nach Art und Herkunft schnell. Wenn jedoch nach 3–4 Wochen die Keimung nicht erfolgt, muß diese Herkunft einer Kühlperiode von 2–4 Wochen ausgesetzt werden. Für die im Himalaya beheimateten Meconopsis ist die Kühlperiode unerläßlich. Sie müssen auch nach erfolgter Keimung noch einige Wochen kühl, unter ca. +12°C, gehalten werden.
10. Diesen größeren, hartschaligen Samen hilft eine leichte, mechanische Beschädigung der Samenschale zum schnelleren Aufquellen. Eine Methode ist es, die Samen zwischen trockenem, scharfen Sand zu reiben oder mit Schmirgelpapier. Man kann ihn auch einige Stunden in „Weichmacher“ (Polyäthylenglycol 6000), wie er bei der Plastikherstellung verwendet wird, einweichen.
11. Opuntien keimen im 2. Jahr nach der Ernte besser und gleichmäßiger. Frischer Samen liegt daher oft ein Jahr in der Erde bis zur Keimung.
12. Keine Kühlperiode erforderlich; trotzdem liegt dieser Samen meist mehrere Monate bis zur völligen Keimung.
13. Diese großen Samen 2–3 Tage in Wasser vorquellen, mit „Weichmacher“ aber höchstens 1 Tag. Danach an der Seite des Keimkegels vom Samen eine hauchdünne Scheibe abschneiden oder abziehen, so daß der Keimling fast frei liegt. Samen mit Schnittstelle nach oben auf feuchtes Aussaatsubstrat (z.B. Vermiculite) aufsetzen. Glashaube oder Glasscheibe dicht abschließend in reichlichem Abstand vom Samen darüber setzen. Die entstehende Luftspannung bei Temperaturen von ca. +22°C fördert die Keimung.
14. Eine Wärmeperiode nach der Aussaat von ca. +25 bis +30°C über etwa 4–5 Wochen, wobei feucht gehalten wird, hebt die Keimhemmung auf. Es zerfällt der im Samen vorhandene, keimhemmende Stoff. Danach die Aussaat sehr kühl stellen, +2°C! Die bei dieser kühlen Temperatur beginnende Keimung zieht sich über ca. 80 Tage hin. Während dieser Zeit dunkel halten (Kühlraum). Danach Temperatur langsam erhöhen und Licht geben.
15. Schnell keimende Saat. Gleichmäßige Feuchtigkeit (nicht naß!) und Temperatur um etwa +20°C. Die Samen nur sehr dünn, ganz feine Saat gar nicht abdecken, aber andrücken. Nach erfolgter Keimung kühler stellen.
16. Wie 15.), jedoch erfolgt hier die Keimung nicht so schnell und auch nicht immer so sehr gleichmäßig, aber doch meist problemlos.
17. Wasserpflanzen in wasserdichten Plastikschalen o. ä. in einer nahrhaften Schlammerte aussäen. Das Wasser darf bis zu 1 cm über der Aussaaterde stehen. Bei guter Wärme (ca. +22°C) aufstellen.
18. Aussaattechnik wie 17.). Die Saatschalen aber nur ca. 2–4 Wochen warm stehen lassen, danach ca. 4–6 Wochen kalt stellen um 0°C herum. Das Wasser darf ruhig gefrieren. Anschließend die Temperatur nur sehr langsam ansteigen lassen.
19. Diese Aussaat benötigt zur Aufhebung der Keimruhe (Zersetzung des keimhemmenden Stoffes) mindestens 6 Wochen gute Bodenwärme, ca. +22°C und gleichmäßige Feuchtigkeit. Anschließend 6–8 Wochen kalt stellen, ca. –4 bis +4°C. Meist beginnt die Keimung schon bei +4°C. Die Wärme nur sehr langsam anheben, nicht über +10°C, bis die Keimung abgeschlossen ist. Wenn die warme oder die kalte Periode nicht ausgereicht haben, dann keimen diese Samen erst im darauffolgenden Jahr. Sie benötigen dann noch mal eine warme Periode (Sommer) und eine kalte Periode (Winter). Bekanntes Beispiel: Cimicifuga, Helleborus.
20. Diese Aussaaten sind sehr wärmebedürftig, +22°C oder auch höher, um ein gutes Keimergebnis zu erzielen. Mäßige, aber gleichmäßige Feuchtigkeit ist sehr wichtig. Gunnera allerdings möchte es besonders feucht (nicht naß) und besonders warm, ca. +24 bis +30°C.

**Allgemeines:**

Stellen Sie niemals Aussaaten in eine Gefriertruhe, Gefrierschrank oder Gefrierraum mit Temperaturen unter –5°C!! Die Ausdehnung des gefrierenden Wassers in den Samenzellen geht in solchem Fall zu plötzlich vor sich. Ein Druckausgleich durch die Zellmembranen hindurch kann so schnell nicht erfolgen. Die Zellwände werden zerrissen und der Samen ist tot. In der Natur kommen solche sekundenschnellen Temperaturstürze in den Minusbereich nicht vor. Auf einen normalen, langsamen Druckanstieg sind die Zellmembranen jedoch eingerichtet und sorgen mit ihrer Durchlässigkeit für einen osmotischen Druckausgleich.

Bei etlichen Kaltkeimern kommt es immer wieder vor, daß ein Teil der Samen schon während der Warmperiode keimt. Diese Sämlinge sollte man unbedingt heraus pikieren bevor die Aussaat kalt gestellt wird. Diese Erscheinung hat mehrere Ursachen. Unter anderem dient sie in der Natur mit zur Arterhaltung in Regionen, wo eine Winterwitterung nicht in jedem Falle gewährleistet ist. Setzt jedoch eine entsprechende Winterwitterung ein, überleben diese vorzeitig erschienenen Sämlinge nicht. Die Art wird dann durch die nach Kälteeinwirkung keimenden Samen erhalten.

Für eine künstliche Kühlperiode bietet sich daher der Kühlschrank oder Kühlraum mit Temperaturen um 0°C an. Weil Aussaatkisten im Kühlschrank meist nicht unterzubringen wären, kann man so verfahren, daß man die Samen, mit etwas feuchtem Sand vermischt, in Plastikbeutel füllt und nach der erforderlichen Wärmeperiode so im Kühlschrank unterbringt. Es ist aber darauf zu achten, daß der Sand in den Beuteln feucht bleibt. Nach Ablauf der erforderlichen Kühlperiode wird dann der Samen mit dem Sand in das Aussaatgefäß ausgebracht und bei der dann erforderlichen Temperatur aufgestellt.

**Nachdruck dieser Aussaatanleitungen, auch auszugsweise, ist nicht gestattet. Die Anleitungen sind nur für die Aussaat der von uns bezogenen Samen gedacht; eine anderweitige Verwendung, z.B. für Unterrichtszwecke, darf nur mit unserem Einverständnis erfolgen.**



1. Cold-germinators are still referred to as frost-germinators, although this isn't quite correct. The sowing must be kept **warm** (about +18 to +22°C) [about 64 to 72°F] and moist for the first 2–4 weeks. After this period the sowing must be kept at a cold temperature (between –4 and +4°C) [between 25 and 39°F] for another 4–6 weeks. Colder temperatures of –5°C [23°F] are only advantageous for most species of the Ranunculus family. It is not so important if the temperature is higher or lower during the cooling period, but the cooling period has to be prolonged because the synthesis of the germination inducer, hormon-like acid, slows down or comes to a standstill.  
  
It is beneficial to cover the sowing with snow during the cooling-period. The temperature below it usually keeps in the optimum range of –4 to 0°C [25 to 32°F]. The sowing is kept moist, and the melting snow helps to destroy the shell, which is advantageous for the germinating seedling. After this cooling-period the sowing may not be immediately exposed to high temperatures. The most effective temperatures are between +5 to +12°C [41 to 54°F], even if germination has started. The best location for this sowing, even in March, April and May, is the open field, the cold frame or a cold greenhouse.
2. Most species of the Ranunculus-family need lower temperatures during the cooling-period – about –5°C [23°F]. In other respects follow the directions in 1. above. The reason is probably the freezing point of these seeds, which is at –7°C [19°F], while most other seeds freeze at –5°C [23°F].
3. These species usually show excellent results if sown soon after the harvest, although most of them only germinate in spring after the effect of winter. For best results please order seeds in time.
4. These are very tiny seeds which should be mixed with finest sand or talcum for an even sowing. Do not cover with compost, only press them in gently. Irrigate from the bottom or with a hand-sprayer, so that the seeds will not be washed away.
5. The directions of 1. do not always show the best results. After the cooling-period some species need a longer time until germination starts. As some seeds do not germinate until the next year, it is important not to throw away the seed boxes too early.
6. These seeds germinate extremely late, sometimes it takes one year or longer before germination starts. To best utilize space and avoid drying out, this seed must be "stratified" (placed in layers of wet sand – alternately a thin layer of seeds and a layer of well-moistened sand, etc.). The stratification boxes have to be kept in the shade to benefit from weather effects – especially winter. A fine wire mesh will protect them from mice and birds. Nurseries have found that concrete boxes are useful for large amounts of seed. In spring frequently check to see if germination has begun. When germination has started, the seeds must be sown immediately in the prepared bed with the moist sand.
7. These seeds must be covered with a layer seed kernel diameter. Keep daytime temperatures at approximately +20°C [68°F], and keep the moisture constant, for Cyclamen, however, +18°C [64°F] is recommended. The seeds must be kept in the light and moderately warm after germination.
8. These perennial seeds germinate very irregularly over a long period. Lower temperatures of less than +5°C [41°F] are very effective. Seed trays should not be discarded prematurely. Constant moisture must be maintained. Do not leave in direct sunlight. For Alstroemeria we recommend to keep sowing for 3 weeks at approximately +30°C [86°F], then 3 weeks at +5°C [41°F], then at +21°C [70°F].
9. These seeds germinate rapidly depending on species and origin. If germination does not occur after 3–4 weeks a cooling period of 2–4 weeks is recommended.
10. For these bigger hard-shelled seeds, mechanical damaging of the shell is helpful for quicker swelling. One method is to grind the seed in dry sharp sand. They can also be treated for several hours in a "softener" (Polyethylenglycol 6000), which is used for the production of plastic material.
11. Opuntias germinate more effectively the second year after harvest. Fresh seed often lies in the ground for about a year before germination.
12. No cooling-period is necessary, but these seeds usually need several months until complete germination.
13. Allow these large seeds to swell up in water for 2–3 days. If a "softener" is used only soak for a maximum of one day. After that cut off a thin slice of the seed close to the germcone so that the embryo is almost bare. Place seed with the cut facing up in a moist seed compost e. g. Vermiculite. This must be covered tightly with glass, a good interval from the seeds. The rising air pressure, at temperatures of about +22°C [72°F], accelerates the germination.
14. A warm period of +25 to +30°C [77 to 86°F] and moist conditions after sowing for about 4–5 weeks neutralizes the germination inhibition. The phytohormones which inhibit germination will then break down. At this point the sowing needs very cool conditions, approximately +2°C [36°F]. Initial germination lasts for about 80 days under these conditions. During this period keep in dark cold storage chamber. Then temperature and lighting must be increased gradually.
15. Rapidly germinating, keep seed in constant moisture (not wet) with temperatures of about +20°C [68°F]. Seeds must be covered thinly. Do not cover very small seeds, but tightly press into the earth. Keep in cooler conditions after germination occurs.
16. See 15 with the exception of germination being slower and more irregular. This poses no problems.
17. Waterplants must be sown in waterproof plastic trays or similar containers containing a nutritious muddy compost. Fill water up to 1 cm over the top of the compost. Keep the trays at warm temperatures of approximately +22°C [72°F].
18. See 17. Allow the seed trays to be left for only 2–4 weeks at warm temperatures, then keep at 0°C [32°F] for another 4–6 weeks. It does not matter if the water freezes. After this treatment allow temperature to rise gradually.
19. To stop the germination inhibition give seeds a warm compost (about +22°C) [about 72°F] with constant humidity for at least 6 weeks. Then keep cold (–4 to +4°C) [25 to 39°F] for 6–8 weeks. Usually, the germination starts at +4°C [39°F]. Raise temperatures gradually up to +10°C [50°F] until germination is completed. If the warm or cold period was not long enough the seeds will not germinate until the following year. They will then need another warm period (summer) and a cold period (winter). Well-known examples: Cimicifuga and Helleborus.
20. To obtain best germination results, seeds need temperatures of +22°C [72°F] or more. Moderate, but constant humidity is very important. Gunnera, however, prefers very moist (not wet) and warm (+24 to +30°C) [75 to 86°F] conditions.

**General remarks:**

Never put the sowing into a freezer with temperatures below –5°C [23°F]! The expansion of the freezing water in the seed cells is too rapid. The cell membrane can not tolerate the pressure compensation. The cell wall would be destroyed and the seed would die. Rapid drops in temperature below the freezing point do not occur naturally. A normal, slow rise in pressure can be tolerated by the cell membrane, its permeability taking care of an osmotic equalization of pressure.

It is possible to use a refrigerator with a temperature of about 0°C [32°F] to create an artificial cooling period. Since it is usually not possible to put the seed trays into a refrigerator, you can mix the seed with moist sand. It should be put into a plastic bag and placed into the refrigerator after the required warm period. The sand must be kept constantly moist. After the required cooling period sow the sand with the seed into seed trays and leave at required temperatures.

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1. Koudekiers worden soms, ten onrechte, nog vorstkiers genoemd. De eerste 2–4 weken na het zaaien dient het uitzaaisel **warm** (ca. +18–22°C) en vochtig gehouden te worden. Pas na deze periode het zaaisel voor ongeveer 4–6 weken kouder zetten bij een temperatuurtussen –4 en +4°C. Bij vertegenwoordigers van de Ranonkelfamilie verdient het de aanbeveling een temperatuur van –5°C aan te houden.  
Overschrijding van de genoemde temperaturen tijdens de koudeperiode is niet schadelijk, maar maakt wél een verlengde koudeperiode noodzakelijk. De opbouw van het noodzakelijke kiemingshormoon kan dan vertraagd of onderbroken zijn.  
Een sneeuwdek tijdens de koudeperiode heeft voordelen. De temperatuur onder een sneeuwdek blijkt vaak de optimale te zijn, namelijk tussen de –4 en 0°C. Ook blijft het zaaisel vochtig terwijl de smeltende sneeuw de zaadhuid poreus maakt, wat van voordeel is op de kieming van het zaad. Kort na de koudeperiode dient het zaaisel niet te worden blootgesteld aan hoge temperaturen. De optimale temperatuur ligt dan tussen de +5 en +12°C, dit geldt ook als de kieming al begonnen is. Voor dergelijke zaaisels is de ideale plek (ook nog in maart, april of mei) buiten in de volle grond, in een bak of koude kas.
2. Het merendeel van de ranonkelachtigen verlangt een wat lagere temperatuur, ca. –5°C. De verdere aanwijzingen zijn gelijk aan die als bovenstaand onder 1.) zijn genoemd. De oorzaak is mogelijk gelegen in het feit dat het vriespunt bij deze zaden op –7°C ligt, terwijl deze bij de meeste andere zaden –5°C bedraagt.
3. Deze zaden hebben het beste kiemresultaat wanneer ze direct na de oogst worden gezaaid. In een aantal gevallen zal de kieming toch pas in het voorjaar geschieden na blootstelling aan winterinvloeden. Deze zaden bij voorkeur tijdig bestellen.
4. Dit is zeer fijn zaad. Voor een gelijkmatige verdeling bij het zaaien kan het worden gemengd met fijn zand of talkpoeder. De zaden niet bedekken, alleen licht aandrukken is voldoende. Bevochtigen door opzuigiging van onder af of van boven met een fijne nevel.
5. De onder 1.) beschreven procedure leidt niet altijd tot een grote opkomst. In sommige gevallen is een langere inwerkingstijd op de zaden nodig. Het zaaisel daarom niet wegdoen maar bewaren tot volgend jaar.
6. Deze zaden hebben veel tijd nodig voor ontkieming, minimaal één en soms meerdere jaren. Ter besparing van ruimte en om uitdroging te voorkomen wordt dit zaad gestratificeerd, d.w.z. afwisselend lagen vochtig zand en een dunne laag zaden. Aldus opgeslagen (op een beschaduwde plaats) worden de zaden blootgesteld aan de (winter-) weersinvloeden. Fijn gaas beschermt de zaden tegen vraat van muizen en vogels. In kwekerijen worden wel betonnen bakken voor dit doel gebruikt. Constante oplettenheid in het voorjaar is nodig om te zien of de kieming al is begonnen. Als dit het geval is moet direct (met het vochtige zand) worden gezaaid in een voorbereid zaai-bed.
7. Dit zaad moet worden afgedekt met een laagje zaaigrond dat net zo dik is als het zaad zelf. Overdag een temperatuur aanhouden van +20°C bij een constante vochtigheid. In het geval van Cyclamen wordt +18°C aanbevolen. Na ontkieming licht en matig warm houden.
8. Dit vaste plantenzaad kiemt onregelmatig gedurende een langere kiemperiode. Ook hier geldt dat temperaturen onder +5°C een gunstige invloed op de kieming hebben. Het zaaisel daarom niet te vroeg wegdoen. Zorg voor een gelijkmatige vochtigheid en voorkom een directe instraling van zonlicht. Voor Alstroemeria adviseren wij het zaaisel gedurende 21 dagen bij ca. +30°C te houden, vervolgens gedurende 21 dagen bij +5°C en dan bij +21°C.
9. Gewoonlijk kiemt dit zaad snel, afhankelijk van soort en herkomst. Als er na 3–4 weken nog geen kieming is dan kan het zaaisel een koudeperiode worden gegeven van 2–4 weken. (Voor Meconopsis, afkomstig uit de Himalaya, is de koudeperiode verplicht en ook na opkomst moet het zaaisel nog een aantal weken koel, bij ca. +12°C, worden gehouden.)
10. Bij deze grotere zaden met een harde zaadhuid helpt een mechanische beschadiging van de zaadhuid waardoor het zaad sneller zwelt. Een methode is het zaad in droog, scherp zand of tussen schuurpapier te wrijven. Er wordt ook wel gebruik gemaakt van een zgn. weekmaker (Polyethyleenglycol 6000) uit de kunststofindustrie.
11. Opuntia kiemt beter en gelijkmatiger in het tweede jaar na de oogst. Vers gezaaid zaad ligt daarom vaak een jaar over voordat kieming volgt.
12. Een koudeperiode is hier niet noodzakelijk. Toch liggen deze zaden vaak een aantal maanden voordat ze massaal kiemen.
13. Deze grote zaden 2 tot 3 dagen laten weken in water. Bij gebruikmaking van een weekmaker slechts één dag. Vervolgens aan de zijkant een dun reepje van de zaadhuid afsnijden of afpellen waardoor de kiem komt bloot te liggen. Het zaad dan, met de snijkant naar boven, in een vochtig zaaimeidium bijv. Vermiculiet leggen en luchtdicht afsluiten onder een kunststof kap of een glasplaat. Zorg voor voldoende ruimte tussen kap en zaad. De hoge luchtvochtigheid in combinatie met een temperatuur van ca. +22°C bevordert een snelle kieming.
14. Een vochtige warme periode van 4–5 weken bij ca. +25–30°C verbreekt de kiemrust. De in het zaad aanwezige kiemremmer wordt dan afgebroken. Vervolgens het zaaisel koud, bij +2°C!, plaatsen. Bij deze lage temperatuur strekt de kieming zich over 80 dagen uit. Gedurende deze tijd het zaaisel donker houden (koelkast). Daarna de temperatuur en het lichtniveau geleidelijk aan verhogen.
15. Dit zaad kiemt snel. Gelijkmatig vochtig houden (niet nat) bij ca. +20°C. Het zaad slechts zeer dun afdekken, fijn zaad echter niet afdekken, maar licht aandrukken. Na de kieming koeler houden.
16. Als bij 15.). Kieming geschiedt meestal probleemloos maar mogelijk minder snel en wellicht ook minder gelijkmatig.
17. Waterplanten worden onder water gezaaid in plastic bakken gevuld met voedselrijk slib. Een laagje water van ca 1 cm boven het slib is voldoende. Tamelijke warm (+22°C) houden.
18. Zaaiprocedure als bij 17.). De zaai bakken slechts 2–4 weken warm houden en vervolgens 4–6 weken koude geven bij 0°C. Bevriezen mag. Daarna de temperatuur geleidelijk laten oplopen.
19. Deze zaaisels hebben voor het verbreken van de kiemrust (de afbraak van de kiemremmers) minstens 6 weken bodemwarmte van +22°C nodig en een gelijkmatige vochtigheid. Vervolgens een koudeperiode geven van ca –4 tot +4°C. Vaak begint de kieming al bij +4°C. De temperatuur dan geleidelijk laten oplopen tot niet meer dan +10°C tot de kieming volledig is. Het kan zijn dat de koude periode of de warme periode niet voldoende lang zijn geweest. In dat geval zal de ontkieming pas het jaar erop plaatsvinden na de invloeden van de zomer (warmte) en winter (koude). Bekende voorbeelden hiervan zijn Cimicifuga en Helleborus.
20. Deze zaaisels verlangen hoge temperaturen (+22°C of meer) voor een goed kiemingsresultaat. Een lichte maar gelijkmatige vochtigheid is zeer belangrijk. Gunnera verlangt een hoge vochtigheid (maar niet nat) en hoge temperaturen, +24–30°C.

**Algemeen:**

Plaats nooit zaaisels in vrieskasten e.d. met temperaturen onder –5°C!! De uitzetting van het bevrorende celvocht gaat te snel, de celmembranen kunnen het drukverschil niet opvangen waardoor de celwanden scheuren en het zaad dood gaat. Zulke snelle temperatuurdalingen komen in de natuur niet voor. Op een geleidelijke drukverhoging kunnen de celmembranen reageren door osmose via de halfdoorlatende celwand waardoor de drukverschillen worden opgeheven.

Bij vele koudekiers kan het gebeuren dat ze al kiemen tijdens de warme periode. Deze kiemplantjes dienen eruit te worden gehaald voordat het zaaisel koud wordt gezet. Dit verschijnsel heeft verschillende redenen. Het draagt onder anderen bij tot het voortbestaan van de soort in gebieden met wisselvallige winters. Mocht een strenge winter voorkomen dan bevroren de vroegtijdig opgekomen kiemplanten. De soort wordt dan in stand gehouden door de zaden die pas kiemen na inwerking van de winterkou.

Voor een kunstmatige koudeperiode is de koelkast of koelruimte met een temperatuur rond 0°C geschikt. Zaaikisten zijn vaak nogal moeilijk te plaatsen in de koelkast. Daarom kan ook worden volstaan met het zaad te vermengen met vochtig zand en zo in plastic zakjes, na de noodzakelijke warme periode, in de koelkast op te slaan. Er moet altijd op worden gelet dat de inhoud van de zakjes niet uitdroogt. Na afloop van de benodigde koudeperiode kan dan het zaad, samen met het zand, worden uitgezaaid bij de geadviseerde temperatuur.

**Nadruk van deze zaai-aanwijzingen, of delen hieruit, is niet toegestaan. De aanwijzingen zijn alleen bedoeld voor de door ons aangeboden zaden. Andere toepassingen, bijv. voor onderwijsdoeleinden, zijn alleen toegestaan na onze schriftelijke toestemming.**

1. Le piante che germogliano a freddo vengono ancora oggi annoverate tra le piante germoglianti a temperature glaciali, il che non è esatto. Le prime 2–4 settimane i sementi devono trovarsi in ambiente **caldo** (circa +18–22°C) e ben inumidito. Solo dopo tale periodo i sementi vengono esposti per circa 4–6 settimane alle basse temperature tra i -4 ed i +4°C. Solo per i ranuncoli risulta benefica una temperatura attorno ai -5°C. Se nel periodo freddo la temperatura dovesse superare il limite superiore o quello inferiore sopra indicati, non si registrano danni, bisogna però prolungare adeguatamente il periodo freddo, poichè in questo intervallo di tempo si rallenta o si blocca il processo di formazione di quell'acido di tipo ormonale che avvia la fase germogliativa. Risulta vantaggioso coprire con neve i sementi nel periodo freddo. Sotto la neve la temperatura si mantiene in genere a livelli propizi tra -4 e 0°C, l'ambiente rimane umido, e la neve sciogliendosi „corrode“ il guscio del seme rendendolo poroso, il che favorisce la fuoriuscita dei germogli. – Passato questo periodo freddo la temperatura non deve salire subito in alto; l'ambito più favorevole è quello tra i +5 ed i +12°C, anche se si vedono spuntare già i primi germogli! Il giusto posto per questi sementi – ciò vale anche fino a marzo/aprile/maggio – è all'aperto, nel cassettoni freddo o nella serra fredda.
2. Nel periodo freddo la maggior parte delle piante del genere dei ranuncoli abbisogna di basse temperature sui -5°C, altrimenti si proceda come descritto al punto 1. La ragione di ciò sta probabilmente nel fatto che il punto di congelamento per questi semi è circa -7°C, mentre per la maggioranza degli altri semi è sui -5°C.
3. I semi di questo genere danno di solito ottimi risultati di germogliamento se si seminano immediatamente dopo il raccolto, seppure la maggioranza di tali speci germoglia poi lo stesso appena in primavera, dopo il trattamento a freddo subito d'inverno. Ordinate perciò tempestivamente questi semi!
4. Qui si tratta di semi molto fini, che consigliamo di mescolare eventualmente con talco o con sabbia finissima, al fine di effettuare una semina uniforme. Non coprire con terra, basta pressare i semi sul terreno. Si irriga dal di sotto oppure impiegando un nebulizzatore, affinché l'acqua non trascini via i semi.
5. Il trattamento descritto al punto 1. non dà sempre risultati del tutto soddisfacenti. Dopo il periodo freddo alcune speci abbisognano ancora di un lungo periodo prima di germogliare. Dunque non gettar via troppo presto i contenitori coi semi. Alcuni semi rimangono in terra ancora un anno intero.
6. Questi semi rimangono in giacenza per molto tempo, 1 anno e più, prima di germogliare. Per ragioni di economia di spazio e anche per evitare un essiccamento, questo seme viene „stratificato“. Ciò significa: i semi vengono messi in sabbia umida a strati. Ad uno strato ben inumidito di sabbia segue un sottile strato di semi e così via di seguito. I cassettoni di stratificazione vengono collocati all'ombra, esposti alle intemperie (specialmente all'influsso del tempo invernale) con una fine rete metallica di protezione contro topi ed uccelli. Per forti quantitativi di semi nei vivai di piante sono stati applicati con successo cassettoni di stratificazione in cemento armato. In primavera bisogna controllare spesso se incomincia già il germogliamento. In caso positivo si prendono i semi assieme alla sabbia, tenuta tutto il tempo ben umida, per portarli sull'aiola già predisposta ad accoglierli.
7. Questo seme deve venir coperto con uno strato di spessore pari al diametro del granello. Ad una temperatura sui +20°C durante il giorno si abbia cura di provvedere all'apporto di umidità sufficiente. Per i ciclamini è preferibile una temperatura di +18°C. A germogliamento avvenuto si provvede ad un'esposizione a luce chiara con temperature tiepide.
8. Qui si tratta di semi di piante perenni, il cui germogliamento molto irregolare si estende per un lungo periodo di tempo. Risulta particolarmente vantaggioso sottoporre i sementi all'influsso di basse temperature sotto i +5°C. Non si distruggano troppo presto i contenitori di semi. Si faccia soprattutto attenzione che l'umidità sia distribuita uniformemente e si eviti l'esposizione diretta ai raggi solari.
9. A seconda della specie e dell'origine questi semi germogliano più o meno presto. Se dopo 3–4 settimane non dovessero ancora germogliare, si sottopongono per 2–4 settimane all'influenza di basse temperature. Per la meconopsis, originaria dall'Himalaia, è assolutamente necessario sottoporre i semi ad un periodo di un'influenza di basse temperature. Anche a germogliamento già avvenuto si mantenga ancora per alcune settimane una temperatura sotto i circa +12°C.
10. Il gonfiamento di questi semi abbastanza grandi e con guscio robusto viene accelerato se si lacera leggermente per via meccanica il loro guscio. Uno dei metodi applicati è quello di sfregare i semi con sabbia aguzza o con carta vetrata. I semi si possono anche rendere molli, immergendoli per alcune ore in „ammorbidenti“ (glicole di polietilene 6000), come quelli impiegati nella produzione di materie plastiche.
11. Le opunzie germogliano meglio e più uniformemente nel 2° anno dopo il raccolto. Il seme fresco rimane pertanto spesso nella terra per un anno prima di germogliare.
12. Non è necessario un periodo di basse temperature; comunque questo seme impiega spesso molti mesi fino al pieno germogliamento.
13. Questi grandi semi si lasciano pregonfiare in acqua per 2 o 3 giorni; se si aggiunge un „ammorbidente“ il periodo di gonfiamento non deve superare 1 giorno. Sulla parte dove si trova il cono del germoglio si taglia via o si pela una sottilissima fetta, di modo che il germoglio rimanga quasi scoperto. Il seme si pone con il punto di taglio all'insù su un substrato di seminatura (p.es. verniculite). Si copre la superficie con una campana o lastra di vetro a buona chiusura; si mantenga una sufficiente distanza dal vetro al seme. La tensione d'aria in tal modo generata ad una temperatura di circa +22°C favorisce il germogliamento.
14. Lo sblocco dell'inibizione di germogliamento si raggiunge sottoponendo i semi all'influenza di un periodo di circa 4–5 settimane di temperature tra i circa +25–30°C in ambiente umido. In tal modo si decompone la sostanza che – presente nel seme – inibisce il germogliamento. Dopo questo trattamento si lasciano i sementi a temperature basse, +2°C! Il germogliamento che inizia in un ambiente così freddo si protrae per un periodo di circa 80 giorni. In tale periodo tenere i sementi all'oscuro (in cella frigorifera). In seguito si aumenta gradualmente la temperatura, esponendo i sementi alla luce.
15. Semi a germogliamento celere. Umidità uniforme (non bagnare!) e temperatura sui +20°C. Appena coprire i semi appena; quelli fini non si coprono, bensì si pressano sul terreno. Mettere al freddo a germogliamento avvenuto.
16. Si procede come al punto 15., solo che in questo caso il germogliamento non avviene celermente; i semi non germogliano neppure uniformemente, però il germogliamento avviene senza problemi.
17. Per la semina delle piante acquatiche si impiega una propizia terra fangosa in contenitori di plastica a tenuta d'acqua o in altri recipienti delle stesse caratteristiche. L'acqua può arrivare ad un livello di 1 cm sopra la terra che copre i semi. Mettere in ambiente a temperatura piuttosto alta (circa +22°C).
18. La tecnica di semina è quella indicata al punto 17. I recipienti coi sementi si lasciano al caldo soltanto per circa 2–4 settimane, dopo di che si mettono per circa 4–6 settimane in ambiente freddo a circa 0°C. Si può lasciar gelare l'acqua. Dopo il periodo predetto si fa salire lentamente la temperatura.
19. Per porre fine al periodo di stasi germogliativa (decomposizione della sostanza che inibisce il germogliamento), questi semi abbisognano di almeno 6 settimane di terreno ben riscaldato, a circa +22°C, e di umidità uniformemente distribuita. Dopo di ciò si espone per 6–8 settimane al freddo, con circa -4 fino a +4°C. Di solito il germogliamento inizia già a +4°C. Aumentare la temperatura molto lentamente, senza superare i +10°C, fino al completamento del germogliamento. Se il periodo caldo o quello freddo erano troppo brevi, questi semi germogliano appena l'anno seguente. Abbisognano poi ancora di un periodo caldo (l'estate) e di un periodo freddo (l'inverno). Un noto esempio: cimicifuga, helleborus.
20. I semi hanno bisogno di molto calore, cioè +22°C ed anche di più, per raggiungere un germogliamento soddisfacente. E' molto importante la presenza di un'umidità ridotta, che sia però in forma. Per quanto concerne la gunnera, questa ha bisogno di molta umidità (ma non di bagnato) e di temperature alte dai circa +24 ai 30°C.

**Note generali:**

Non porre mai i semi in un congelatore o in una cella di congelamento con temperature sotto i -5°C! La dilatazione dell'acqua che gela nelle cellule dei semi avviene a tali condizioni in modo troppo repentino. Non riesce a stabilirsi tanto presto un compenso di pressione attraverso le membrane cellulari. Le pareti delle cellule si lacerano ed il seme muore. In natura non si hanno casi di abbassamenti così repentini nell'ambito di temperature sotto lo zero. Le cellule però non vengono danneggiate, se la pressione aumenta normalmente e lentamente; allora le cellule compensano la pressione eccessiva grazie all'osmosi che avviene tramite le pareti cellulari semipermeabili.

Per periodi di freddo artificiale si impieghino perciò celle o armadi frigoriferi con temperature attorno allo 0°C. Poichè è difficile collocare contenitori di seminazione in armadi frigoriferi, si può procedere nel seguente modo: si mescolano i semi con un po' di sabbia umida, mettendo il tutto in sacchetti di plastica. Si lascia trascorrere il necessario periodo con alta temperatura prima di porre i semi così trattati in frigorifero. Si faccia però attenzione che la sabbia nei sacchetti rimanga umida. Trascorso il necessario periodo freddo, semi e sabbia vengono messi nel contenitore di seminazione che viene poi lasciato alla temperatura adatta.

**E'vietato riprodurre, anche parzialmente, il testo delle sopra citate istruzioni di semina. Queste istruzioni sono applicabili solo alla semina dei semi acquistati presso di noi; un'applicazione per altri scopi, p.es. a scopo didattico, è ammissibile soltanto previo nostro benestare.**

1. 低温発芽植物は今日でもなお、適切とはいえない表現”霜発芽植物”で呼ばれています。蒔かれた種子は最初の2～4週間は、温かく(約18～22℃)十分な湿り気をもつ状態に置いて下さい。その後4～6週間に渡り-4℃から+4℃の冷温に置きます。多くのキンポウゲ科の植物に限り、-5℃前後の気温が有利条件になります。  
冷却期間中上記の気温を下回ったり、上回ったりすることが仮にあっても、決して害はありませんが、その場合は、冷却期間をそれに応じて延長する必要があります。これは、その期間中、発芽を促す、ホルモンに似た酸の増成過程の進行速度が落ちたり、あるいは停止したりするためです。  
蒔いた種子を冷却期間中雪でおおうことが出来れば、有利条件となります。雪の下では、温度はほとんどの場合-4℃から0℃の好ましい範囲にあり、湿り気が保たれます。さらに、雪は解けかかると種子の外皮を”腐食”して浸透性を与え、芽が伸び出るのに有利になります。いかなる場合も、冷却期間後すぐに高温下に置くことはしないで下さい。それとは反対に、好ましい温度域は+5℃から12℃の間であり、発芽が観察された後もこの温度を保つ必要があります。従って、これらの蒔かれた種子にとっての適所は、3月4月5月でも、屋外、冷却箱あるいは冷室です。
2. 複数のキンポウゲ科の植物は、冷却期間中これよりさらに低温の、約-5℃を必要とします。その他の手順は、1)に記述した通りです。これは恐らく、これらの種子の氷点が約-7℃であるのに対して、その他多数の種子では-5℃であることに原因すると考えられます。
3. これらの種属は、収穫後間もなく蒔かれると、実際の発芽は多くの場合、冬の影響を受けた後春になってから始めて起こりますが、その発芽成績はほとんどの場合、非常に優秀です。従って、これらの種子は適時に蒔いて下さい。
4. ここで扱うのは非常に細かい種子で、種蒔きにあたっては、場合によっては滑石粉又は最も細かい種類の砂を混ぜて、一様に蒔く必要があります。種子の上には土をかけず、押しつけるだけにします。水やりは下から、あるいは目の細かい霧吹き器を使って行い、種子を流さないようにします。
5. 1)に記述した手順は、あらゆる場合に首尾上々に運ぶわけではなく、いくつかの種属では、冷却期間後発芽するまでにさらに長期間を要します。ですから、種子を蒔いた容器を早々と捨てることがないようにして下さい。種子によっては冷却期間後さらに1年間も土中に眠っていることがあります。
6. これらの種子は発芽まで非常に長期間、1年あるいはそれ以上、土中に眠ります。場所を節約するため、又干からびてしまうのを防ぐために、これらの種子を”成層”します。即ち、種子を湿った砂の層の間に埋めるのです。十分に湿った砂の層と薄い種子の層を交互に重ねます。成層箱は日陰に置いて、天候の影響(特に冬の天候)に曝し、細かい金網でネズミや鳥から守ります。多量の種子を蒔く場合はコンクリート製の成層箱が良いことが育樹園で確認されています。春になったら、発芽がすでに始まっているかどうかを頻りに点検すべきです。その場合は、常時湿った状態に保たれていた砂とともに種子を、あらかじめ準備しておいた苗床に即刻出さなければなりません。
7. これらの種子は、種子粒の直径と同じ厚みの土でおおって下さい。日中の気温20℃前後で、常時均一に湿り気を保つ様配慮します。シクラメンには、しかし18℃が望まれます。発芽が起こった後は、明るく、適度に温かい場所に置きます。
8. ここで扱うのは非常に不均一に発芽し、長い発芽期間を持つことを特徴とする多年生草木の種子です。ここでもやはり、5℃未満の低温の影響が非常に有利です、種蒔き容器を早々と廃棄しないで下さい。特に一様に湿り気を与えることを配慮し、決して直射日光にさらさないこと。ユリズイセンは、蒔いた種子を21日間約30℃の状態に置いた後、21日間5℃に、引き続き21℃に置くことをお勧めします。
9. 種と出所によって早く発芽します。しかし3～4週間たっても発芽が起こらない場合は、その出所の種子には2～4週間の冷却期を定める必要があります。ヒマラヤ原産のメコノプシスには冷却期が不可欠です。発芽が成った後も、2～3週間は約12℃未満の低温を保つようにするべきです。
10. これらの大きめで硬い外皮を持つ種子には、種子の外皮にかかる傷をつけてやると、種子粒が水をふくんでふくらむのを早めることが出来ます。種子を乾燥した鋭利な砂の間で擦ったり、紙ヤスリを使って擦ることも一方法です。あるいは、プラスチック製造に応用されているように、”柔弱剤”(ポリエチレングリコール6000)の中に2、3時間浸けて柔らかくすることも出来ます。
11. オブンチエン(サボテン)は収穫後2年目の方が首尾よく、一様に発芽します。そのため、新しい種子はしばしば、発芽まで1年間土中に眠ります。
12. 冷却期間を置く必要はありませんがこれらの種子は、多くの場合、完全に発芽するまで数カ月を要します。

13. これらの大粒の種子は、2～3日水に浸けて柔らかくします、柔弱剤を使用する場合は、1日が限度です。その後、円錐状の種子の側面からごく薄い小片を切り取るかはぎ取るかして、芽がほぼ完全に劉き出しになるようにします。切り取った箇所が上を向くように、種子を湿った種蒔き用培養基（例えばフェミクルテ）の上に置きます。ガラス円盤又はガラス板を、種子から十分な間隔をもたせて置き、きっちりと密閉します。気温約22℃のもとで発生する空気圧が発芽を促進します。
14. 種蒔き後、約25℃～30℃の温暖期間を約4～5週間置き、この間湿り気を保つと、発芽抑制が解除されます。種子の中にある発芽を抑制する物質が壊れるためです。その後蒔かれた種子を+2℃の冷温に保ちます。この冷温下で始まった発芽の進行は長引き、約80日以上に渡ります。この期間中は暗い場所（冷室）に置くこと。その後は、温度をゆっくりと上げ、光に当てます。
15. 蒔くと早く発芽する種子です。一様な湿り気（濡れた状態でなく）と約+20℃前後の気温。これらの種子にはごく薄く土をかぶせ、丁寧に蒔いた場合は土をかぶせず押しつけるだけにすること。発芽後は温度を下げて下さい。
16. 15)と同じですが、発芽はそう早くは進行せず、非常に一様にも起こりません。それでも発芽には、ほとんどの場合、問題はありませぬ。
17. 水生植物は、水もれしないプラスチック容器又はそれに類似した容器に養分の多い泥土を入れ、その中に種蒔きします。水は、種を蒔いた土の上1cmまで入れて構いません。十分な暖かさ（約22℃）のもとに置いて下さい。
18. 種蒔きの手法は17)と同じですが、種蒔き容器は約2～4週間だけ温かい場所に、その後約4～6週間、0℃前後の冷温下に置きます。水は凍っても構いません。引き続き温度を非常にゆっくりと上げて行きます。
19. この種子は蒔かれると、発芽制止の解除（発芽を抑制している物質の分解）のために少なくとも6週間約22℃の土中温度と、一様な湿り気を必要とします。その後引き続いて6～8週間、約-4℃から+4℃の冷温下に置きます。多くの場合、+4℃で既に発芽が始まります。温度の上昇はごくゆっくりと行い、発芽が終了するまで10℃を越すことがないようにします。冷却期間又は温暖期間が十分に取られなかった場合は、これらの種子は次の年になってから発芽します。その場合は、もう一度温かい期間（夏）と冷たい期間（冬）を各々一期づつ必要とします。周知の例：キミキフーガ、クリスマスローズ
20. これらの種子は蒔かれると、優良な発芽成績を達成するためには、22℃又はそれ以上の暖かさを必要とします。ほどほどの、しかし一様な湿り気が非常に大切です。グンネーラは但し、特に十分な湿り気（濡れた状態でなく）と約24℃から30℃の特別の暖かさを好みます。

## 総括のご案内

蒔かれた種子は決して、温度-5℃未満の冷凍庫、冷凍ケース、冷凍室内には置かないで下さい。そうした場合は、種子の細胞内で氷結する水分の膨張の速度が早すぎるのです。細胞膜を介する圧力の均衡作用はそう迅速には進行しないため、細胞壁が裂け、種子は死にます。自然界においては、そのようなマイナス域での瞬時の温度急降下は起こりません。細胞膜は、通常の、ゆっくりと進行する圧力上昇に対しては十分対応出来るよう創られており、又、透過性を有するため、浸透性の圧力均衡を保ちます。

いくつかの冷温発芽植物においては、種子が部分的に温暖期に既に発芽してしまうことが再三再四起こります。これらの実生は、蒔いた種子を冷温下に置く前に移植されなければなりません。この現象にはいくつかの原因があります。そのひとつに、冬の天候が必ず訪れるとは限らない地域において、種の保存の役割を果たす、ということがあります。相応する冬の天候が訪れば、この早期に発芽した実生は生き延びることは出来なくなります。種属はその場合、冷温の影響を受けた後に発芽する種子により保存されます。

人工的な冷却期にはそのようなわけで、0℃前後の温度の冷蔵庫又は冷室がむいています。種蒔き箱は多くの場合、冷蔵庫に収容出来ないで、種子を少し湿った砂に混ぜてプラスチック袋に詰め、必要な温暖期間後、冷蔵庫に収容することも出来ます。その時は、袋内の砂が湿り気を保つよう注意する必要があります。必要とされる冷却期間の終了後は、種子を砂と共に種蒔き箱に出し、必要な温度下に置きます。

種蒔き案内書の複写は、例え抜粋であっても許可されていません。案内書は、当社の栽培した種子の種蒔きをのみ対象として作製されています。教育等、その他の目的での使用は、当社の了解なしに行わないで下さい。

All sales are subject to the following terms and conditions accepted by all customers when placing their orders.

## General Terms of Delivery

- Every consignment should be inspected upon delivery. Complaints about any perceptible defects relating to the goods or the packaging and any weight discrepancies must be brought to the Seller's notice no later than the 5th working day and any deficient germination vigour no later than 3 weeks after receipt of the goods. Notice of any defects which are not detectable until a later date must be given without delay. In the event of any dispute the goods shall, upon prior notification to the Seller, be re-examined by the Institute of Applied Botany, Hamburg/Germany (Staatsinstitut für angewandte Botanik), whose analysis shall be recognized as decisive by both parties. The expenses shall be borne by the losing party.
- If the Buyer has justifiably complained about perceptible defects or deficient germination vigour, the Seller shall be obligated to take back the goods, but not to deliver replacement goods, nor to grant a price discount, nor to pay compensation for damages.
- In the case of all other defects the Seller shall be liable for damages proved in due time and not exceeding the invoiced amount for the goods in question; no further liability will be assumed. The Buyer shall waive all other statutory or private claims. The same shall apply in the event that goods other than those specified are delivered. The descriptions given in this catalogue are not to be regarded as warranted qualities.  
  
The Seller does not accept any responsibility for the outdoor viability of the goods as this is dependent on outside influences beyond control.  
  
Furthermore, the Seller is not liable on account of seed infestation and transmission of diseases or pests.
- The place of performance and jurisdiction for both parties is Schwarmstedt / Lüneburg. German law is applicable.
- Acceptance of orders for items which are not yet in stock is subject to the receipt of marketable goods.  
  
Crop failures or non-marketability of goods releases the Seller from his obligation to deliver.
- The Seller is entitled to withdraw from the contract or to postpone delivery if, through no fault of his own, prompt delivery is made impossible by interruptions of traffic, measures ordered by public authorities, or other events of force majeure. Furthermore, the Seller is entitled to withdraw from the contract without rendering compensation, if he is given cause to doubt the Buyer's credit standing and the Buyer fails to pay in advance or furnish security at the Seller's request.
- Ownership of all goods supplied by the Seller will be retained by the Seller until all receivables and any balance on current account debit to the Buyer have been settled or, in the case of payment by cheque or bill of exchange, until such has been honoured.
- The plants grown from the goods shall be deemed as security assigned to the Seller until the aforementioned time or, in the case of outdoor crops, until these have been extracted from the land. In lieu of delivery of the goods the Seller may hold them in safe custody for the creditor free of charge. The German law relating to the safeguarding of fertilizer and seed supplies shall apply *mutatis mutandis*.
- In the event that the Buyer ceases all payments prior to paying for the goods delivered, the Seller shall have the rights specified in the Bankruptcy Act pertaining to the segregation of goods or the assignment of the right to consideration. The segregatable goods shall be set off against the purchase price claim at 65% of the maximum quantity wholesale price but no higher than 65% of the price invoiced at the time of delivery. The balance of the purchase price shall remain payable.
- Unless otherwise agreed, the above terms and conditions shall apply analogously to the delivery of other horticultural products.
- Should any of the above terms and conditions become legally ineffective on account of cancellation, other agreements or for other reasons, the remaining provisions shall remain binding.

## Specific Terms of Delivery for Commercial Gardeners

- All offers/quotations are without obligation and without relation to any previous purchases. Previous prices become invalid as soon this list is issued.
- The prices shown in this list are net prices in EURO and, unless otherwise agreed, do not include packing and are free place of shipment, for domestic customers plus the Value Added Tax applicable on the day of delivery. The packaging is charged at the lowest possible price, but is not returnable.
- Pricing: 0.1g to 9.9g at the 1g price; 10g to 99.9g at the 10g price; 100g to 999.9g at the 100g price; 1kg to 9.999kg at the 1kg price; prices for larger quantities are given upon inquiry.  
  
If a price per 1000 seeds is not listed, orders in seed units will be converted from an average seedcount into gram units and charged accordingly.  
  
Minimum order value 25 € net. Orders less than 25 € will be charged the difference.  
  
The Seller is entitled to increase to the next largest unit any order quantities other than those listed above amounting to no more than 50 € in value. If prices are not quoted for smaller quantities, the respective higher sliding-scale price will be invoiced nonetheless.  
  
Minimum charge per item 2 € net.
- Shipping shall be at the Buyer's risk in accordance with clearly specified shipping instructions. Consignments will be insured at the expense of the Buyer against transport risks. Otherwise the Seller shall use his own discretion without accepting any responsibility.
- Packets whose closure has been damaged or some of whose contents have already been used cannot be taken back. In the event that liability exceeding that outlined in section 3 of the General Terms of Delivery is obligatory by law, proof of the defects claimed – in particular non-trueness of species or variety – must be furnished by the Buyer with the contents of a previously unopened packet sealed by the Seller or breeder.  
  
A fee of minimum 30% of the goods value shall be charged to the Buyer's account for any return of goods attributable to the fault of the Buyer or cancellation of orders at short notice. Return of goods after 30 days is not accepted.  
  
Seeds are perishable goods. Every order is matched to the customer's individual requirements. A right of cancellation / right of return on behalf of traders/ business is therefore excluded. Jelitto Staudensamen GmbH is not obligated and on principal, not prepared to participate in dispute settlement hearings before an arbitration committee.
- Unless otherwise agreed, all invoices shall be payable net cash upon receipt; bank interest (1,5% p.m.) and expenses will be charged for overdue payment unless other rights are asserted. No discount is granted when payment is made by credit card. If cash-on-delivery is not requested, this must be expressly indicated, new customers being requested to furnish references. COD charges shall be at the expense of the Buyer.
- All photographic material supplied is copyright of Jelitto Staudensamen GmbH. The photographic material shall not be duplicated or passed on to third parties.  
  
The one-off right of use is granted under the express condition that the recipient shall use the photographic material for the agreed purpose only. The photographic material may only be used under the complete name under which the material was supplied.  
  
In the event of any breach of these conditions, Jelitto Staudensamen GmbH will claim damages of not less than 250 € per individual case.
- Should any of the above terms and conditions become legally ineffective on account of cancellation, other agreements or for other reasons, the remaining provisions shall remain binding.