## Seed increase manual for Beta

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Site characteristics Longitude:0180000E Latitude:0531811N Altitude: 64 m

Soil type:lessive soil Mean annual temperature: 7,5 °C Mean annual rainfall:590 mm

B.vulgaris subsp. vul.,bi-POL	
	Measure
Seed preparation	Seed dressing
	October, heated greenhouse
Sowing	
<b>0</b>	
	Into 8 cm pots, supplementary artificial light
Transplanting	
	NPK fertiliser, according to need
Fortilisation	
Verneliestion	During winter at 4 to 6 ° C with 10 hrs supplementary light
vernalisation	During winter at 4 to 6 °C with 10 his supplementary light
	Discute stants to the Cold state of Assell and Marcold Marcold
	Directly planted into field plots end of April/ early May at
Cultivation of seed mother plants	60 x 60 cm distance between plants
	50 plants
Effective population size	
	Isolation greenhouse or spatial isolation in the field, then hemp is used
Pollination control	as screen to prevent cross-pollination between accessions
	Wind pollination
Pollination method	
Conditions during seed ripening	Depends on the weather.
	Starts when seeds skin colour of fruits of the upper third
	of the stem turns to dark brown. Single
Seed harvest procedure	plants are harvested depending on maturity
Pre-processing of seeds	Plants are dried at 20- 25 °C
The precedening of cooke	
Threshing	Threshing machine
Theshing	
Final processing	Sioving by band, air congrator, polishing
	Sleving by hand, an separator, polisining.
Druing before storage	To 5 _ 9% mainture content
Drying before storage	
Storage	alega jara at 15 °C long term aterage
Storage	glass jars at -15 C - long term storage.
	According to 151A method, commonly used for sugar beets, count after 7 and 14
Germination test	days.
Problems encountered/	
Remarks	

B.vulgaris subsp.vul., an-POL	
	Measure
Seed preparation	Seed dressing
Sowing	Depending on vernalisation requirement sowing starts February-Marcl
g	
	Into 8 cm nots or small neat nots 12/18° C. supplementary artificial ligh
Trononlanting	
	NDK fortilisen essentian te need
	NPK tertiliser, according to need
Fertilisation	
Vernalisation	not required
Cultivation of seed mother plants	In 20 cm pots in the isolation greenhouse.
	30 - 40 plants
Effective population size	
•••	
	Isolation greenhouse
Pollination control	
	Wind pollination
Pollination mathed	Wild polination
Polimation method	
Conditions during cood ringning	Depende en the weether
Conditions during seed ripening	
	Other the sub-second section section of the state of the summer station.
	Starts when seeds skin colour of fruits of the upper third
	of the stem turns to dark brown. Single
Seed harvest procedure	plants are harvested depending on maturity.
Pre-processing of seeds	Plants are dried at 20 - 25 °C.
Threshing	Threshing machine
Final processing	Sieving by hand, air separator.
Drying before storage	To 5 - 8% moisture content.
Storage	Glass jars at –15 °C - long term storage.
Germination test	According to ISTA method, commonly used for sugar beets, count after 7 and 14 days.
Problems encountered/	
Remarks	
Nonial No	

Measure
Seed dressing
October, heated greenhouse
Into 8 cm pots, supplementary artificial light
NPK fertiliser, according to neec
During winter at 4 to 6 ° C with 10 hrs supplementary light
Directly planted into field plots end of April/ early May at
60 x 60 cm distance between plants
40 plants
Spatial isolation in the field, then hemp is used
as screen to prevent cross-pollination between accessions
Wind pollination
Depende en the weather
Starta when apada akin calour of fruita of the upper third
Starts when seeus skin colour of muits of the upper third
of the stem turns to dark brown. Single
plants are narvested depending on maturity.
Plants are dried at 20- 25 °C.
I nresning machine
Sieving by hand, air separator, polishing.
To 5 - 8% moisture content.
glass jars at –15 °C - long term storage.
According to ISTA method, commonly used for sugar beets, count after 7 and 14 days.
The Mediterranean wild accessions show very different vegetative phase from sowing to
flowering.

B.vulgaris subsp.mar.,an-POL	
	Measure
Seed preparation	Seed dressing
Sowing	February, March in greenhouse
Trancplanting	Into small pots.
	NPK fertiliser, according to need
Fertilisation	
Vernalisation	Not required.
	· · · · · · · · · · · · · · · · · · ·
Cultivation of seed mother plants	In 20 cm pots in greenhouses .
	30 - 40 plants
Effective population size	
· ·	
	Isolation in greenhouse compartment
Pollination control	
	Allogamous Species - wind pollinatior
Pollination method	
Conditions during seed ripening	During sunny periods temperature is higher than 30 °C.
	Starts when seeds skin colour of fruits of the upper third
	of the stem turns to dark brown. Single
Seed harvest procedure	plants are harvested depending on maturity.
Dec managering of socials	
Pre-processing of seeds	
Throshing	Threehing machine
Final processing	Sieving by hand, air separator, polishing
Drving before storage	To 5 - 8 % moisture content
Storage	Glass jars at –15 °C - long term storage.
Germination test	According to ISTA method, commonly used for sugar beets, count after 7 and 14 days.
Problems encountered/	
Remarks	

B.patula-POL	
	Measure
Seed preparation	Seed dressing
Sowing	February, March in greenhouse
	Into small pots.
Transplanting	
	NPK fertiliser, according to need
Fertilisation	
Vernalisation	Not required.
Cultivation of seed mother plants	In 20 cm pots in greenhouses .
	30 - 40 plants
Effective population size	
	Isolation in greenhouse compartment.
Pollination control	
	Allogamous species - wind pollination
Pollination method	
Conditions during seed ripening	During sunny periods temperature is higher than 30 °C.
	Starts when seeds skin colour of fruits of the upper third
	of the stem turns to dark brown. Single
Seed harvest procedure	plants are harvested depending on maturity.
Pre-processing of seeds	Plants are dried at 20 - 25 °C.
Threshing	I hreshing machine
Final processing	Sieving by hand, air separator, polisning.
Device a badance at a second	To 5 0.00 mointure contant
Drying before storage	105-8% moisture content.
01	Close interest 45 °C large term atomage
Storage	Glass jars at -15 °C - long term storage.
	According to ISTA method, commonly used for sugar basta, sound after 7 and
Cormination toot	14 days
Germination test	14 uayo.
Problems encountered/	
Remarks	

B.macrocarpa-POL	
	Measure
Seed preparation	Seed dressing
Sowing	February, March in greenhouse
	Into small pots.
Transplanting	
	NPK fertiliser, according to need
Fertilisation	
Vernalisation	Not required.
Cultivation of seed mother plants	In 20 cm pots in greenhouses.
	30 - 40 plants
Effective population size	
P. W. et la seconda d	Isolation in greenhouse compartment
Pollination control	
	Allegemeus species , wind pollipstick
Pollingtion mathed	Allogatious species - wind polititation
Conditions during seed ripening	During suppy periods temperature is bigher than 30 °C.
Conditions during seed ripening	
	Starts when seeds skin colour of fruits of the upper third
	of the stem turns to dark brown. Single
Seed harvest procedure	plants are harvested depending on maturity.
Pre-processing of seeds	Plants are dried at 20 - 25 °C.
Threshing	Threshing machine
Final processing	Sieving by hand, air separator, polishing.
Drying before storage	To 5 - 8 % moisture content.
Storage	Glass jars at –15 °C - long term storage.
	According to ISTA method, commonly used for sugar beets, count after 7 and 14
Germination test	days.
Problems encountered/	
Remarks	

B.trigyna-6x-POL	
	Measure
	Before sowing seedballs are soaked in concentrated I2SO4 4-5h, then washed in the
Seed preparation	rinsing water 2h and dried in 30-35° C during the night.
Sowing	March-May in trays
ŭ	
-	Into 8 cm pots, then transplanted into 12 cm pots, finally to the field or into larger
	pots.
Transplanting	
	NPK fertiliser, according to need
Fertilisation	
	During winter in the field. Plants covered with a peat laver or in cool greenhouse in
Vernalisation	build writer in the field. Trains covered with a pear layer of in coor greenhouse in the winter $(14 - 6^{\circ} \text{ C})$ with 10 b supplementary light
	In the field in isolation plots or in groonbourse in the great pate. In the field plants star
Outling the stand worth as along to	fin the field in Isolation plots of in greenhouse in the great pots. In the field plants star
Cultivation of seed mother plants	tiowering in June.
	20-30 plants
Effective population size	
Pollination control	Apomictic propagation
Pollination method	
	In the field depends on the weather, in the greenhouse - during sunny periods
Conditions during seed ripening	temperature more than 30 °C.
	Starts when seeds skin colour of fruits of the upper third
	of the stem turns from to dark brown. Single
Seed harvest procedure	plants are harvested depending on maturity.
Pre-processing of seeds	Plants are dried at 20 - 25 °C.
Threshing	Threshing machine
Final processing	Sieving by hand, air separator, polishing.
· · ·	
Drying before storage	Three weeks at 20 - 25 °C.
Storage	Glass jars at -15 °C - long term storage.
Germination test	No test available
Problems encountered/	
Pomarke	Plant are vigorous and healthy. Seed production is almost without problems
Ivernal No	riant are vigorous and nearing. Seed production is almost without problems.

B.coroffiflora-4x-POL	
	Measure
	Before sowing seedballs are soaked in concentrated H2SO4 4-5h, then washed in the rinsing
Seed preparation	water 2h and dried in 30-35° C during the night.
Sowing	March-May in travs
	Into 8 cm pots, then transplanted into 12 cm pots, finally to the field or into larger pots
Transplanting	
	NPK fortilison according to pood
Fortilization	
	Designs for the field Discourse of the second state of the second state of the second state of the second state
	During winter in the field. Plants covered with a peat layer or in cool greenhouse in the winter
Vernalisation	(+4 - 6° C) with 10 h supplementary light.
	In the field in isolation plots or in greenhouse in the great pots. In the field plants star
Cultivation of seed mother plants	flowering in June.
	20-30 plants
Effective population size	
Pollination control	Isolation in the field or in greenhouse
	Allogamous species - wind pollination
Pollination method	
	In the field depends on the weather, in the greenhouse - during suppy periods temperature
Conditions during seed ripening	more than 30 °C
	Starts when seeds skin colour of fruits of the upper third
	of the stem turns from to dark brown. Single
Sood barwast procedure	plante are harvested depending on maturity
Seed harvest procedure	
Pro processing of coods	Planta are dried at 20, 25 °C
Fie-processing of seeds	
Threating	Threading machine
Threshing	
Plant and a second second	Of a first has had a first subscription and first first
Final processing	Sleving by hand, air separator, polisning.
Drying before storage	Three weeks at 20 - 25 °C.
<b>a</b> .	
Storage	Glass jars at –15 °C - long term storage.
Germination test	No test available.
Problems encountered/	Regular powdery mildew infections. Plant are vigorous and healthy. Seed production is
Remarks	almost without problems.

B.macrorhiza-2x-POL	
	Measure
	Before sowing seedballs are soaked in concentrated I2SO4 4-5h, then washed in rinsing
Seed preparation	water 2h and dried in 30-35° C during the night.
pp	
Sowing	March-May in travs
Sowing	
	into 8 cm pots, then transplanted into 12 cm pots, finally to the field or into larger pots
Transplanting	
	NPK fertiliser, according to need
Fertilisation	
	During winter in the field. Plants covered with a peat layer or in cool greenhouse in the winter
Vernalisation	$(+1, -6^{\circ} C)$ with 10 b supplementary light
Verhalisation	
	In the field is idelation plate or is greenhouse in the prest acts. Direct start flows i
	In the field in isolation plots of in greenhouse in the great pots. Plants start flowering very
Cultivation of seed mother plants	early. In the field in the end of May.
	20-30 plants
Effective population size	
Pollination control	Isolation in the field or in greenhouse
	Allogamous species - wind pollination
Dellinetien methed	Allogarious species - wind poliniation
Pollination method	
	In the field depends on the weather, in the greenhouse - during sunny periods temperature
Conditions during seed ripening	more than 30 °C.
	Starts when seeds skin colour of fruits of the upper third
	of the stem turns from to dark brown. Single
Seed harvest procedure	plants are harvested depending on maturity.
Pre-processing of seeds	Plants are dried at 20 - 25 °C
The processing of secus	
Threehing	Threading machine
Threshing	
Final processing	Sieving by hand, air separator, polishing.
Drying before storage	Three weeks at 20 - 25 °C.
Storage	glass jars at -15 °C - long term storage.
Germination test	No test available
Commution test	
Drohlomo enecuntored/	Pagular naudar ( mildau infactiona
Problems encountered/	Regular powdery mildew infections.
Remarks	Low seed production.

B.lomatogona-2x-POL	
	Measure
	Before swing seedballs are soaked in concentrated H2SO4 4-5h, then washed in rinsing water
Seed preparation	2h and dried in 30-35° C during the night.
•••	
Sowing	March-May in travs
couning	
	late 0 and rate that there to many laster do any note finally to the field on interlandon other
	into 8 cm pots, then transplanted into 12 cm pots, finally to the field or into larger pots
Transplanting	
	NPK fertiliser, according to need
Fertilisation	
	During winter in the field. Plants covered with a peat layer or in cool greenhouse in the winter
Vornalisation	$(+A - 6^{\circ} C)$ with 10 b supplementary light
Verhalisation	
	la des field in instation plate on in anomenante in the superiority of the Politic States and
	In the field in Isolation plots or in greenhouse in the great pots. In the field plants star
Cultivation of seed mother plants	flowering in June.
	20-30 plants
Effective population size	
· ·	
Pollination control	Isolation in the field or in greenhouse
	Allegemeus aposice wind pollination
	Aloganous species - wind polination
Pollination method	
	In the field depends on the weather, in the greenhouse - during sunny periods temperature
Conditions during seed ripening	more than 30 °C.
	Starts when seeds skin colour of fruits of the upper third
	of the stem turns from to dark brown. Single
Seed harvest procedure	plants are harvested depending on maturity
Dre pressing of coods	Planta are dried at 20 - 25 °C
Fre-processing of seeds	
The set is a	The set is a set if a
Inresning	I nresning machine
Final processing	Sieving by hand, air separator, polishing.
Drying before storage	Three weeks at 20 - 25 °C.
Storage	Glass jars at -15 °C - long term storage
Gormination tost	Ne test available
Germination test	ויט נכז מימוומטוכ.
Problems encountered/	
Remarks	Low seed production. Small monogerm and bigerm seeds.

B.Iomatogona-4x-POL	
	Measure
Seed preparation	Before swing seedballs are soaked in concentrated H2SO4 4-5h, then washed in rinsing water 2h and dried in 30-35° C during the night.
Sowing	March-May in trays
Transplanting	Into 8 cm pots, then transplanted into 12 cm pots, finally to the field or into larger pots.
Fertilisation	NPK fertiliser, according to neec
Vernalisation	During winter in the field. Plants covered with a peat layer or in cool greenhouse in the winter (+4 - 6° C) with 10 h supplementary light.
Cultivation of seed mother plants	In the field in isolation plots or in greenhouse in the great pots. In the field plants start flowering in June.
Effective population size	20-30 plants
Pollination control	Apomictic propagation
Pollination method	
Conditions during seed ripening	In the field depends on the weather, in the greenhouse - during sunny periods temperature more than 30 °C.
Seed harvest procedure	Starts when seeds skin colour of fruits of the upper third of the stem turns from to dark brown. Single plants are harvested depending on maturity.
Pre-processing of seeds	Plants are dried at 20 - 25 °C.
Threshing	Threshing machine
Final processing	Sieving by hand, air separator, polishing.
Drying before storage	Three weeks at 20 - 25 °C.
Storage	Glass jars at –15 °C - long term storage.
Germination test	No test available

B.procumbens-POL	
	Measure
Seed preparation	Seed dressing
Sowing	End of March/ begin of April
	Into 8 cm pots, then transplanted into 12 cm pots, finally to the field or into
	larger pots.
Transplanting	
· · · ·	
	NPK fertiliser, according to need
Fertilisation	
Vernalisation	Not required
Cultivation of seed mother plants	In 22 cm pots. Transfer into isolation greenhouses end of May
	in 22 on pois. Transier into isolation greenhouses end of may
	10 plants
Effective population size	
	lealation groophouse
Dellingtion control	isolation greethouse
Pollination control	
	M/m - I II
	wind pollination
Pollination method	
Conditions during seed ripening	In the greenhouse - during sunny periods temperature more than 30 °C.
	Brown to black coloured seeds are shattering. Seeds are harveste
Seed harvest procedure	by hand continuously.
Pre-processing of seeds	
Threshing	
Final processing	Sieving by hand, air separator, polishing.
Drying before storage	Three weeks at 20 - 25 °C.
Storage	Glass jars at –15 °C - long term storage.
Germination test	No test available
Problems encountered/	
Remarks	

B.webbiana-POL	
	Measure
Seed preparation	Seed dressing
Sowing	End of March/ begin of April
	Into 8 cm pots, then transplanted into 12 cm pots, finally to the field or into
	larger pots
Transplanting	
Transplanting	
	NPK fertiliser, according to need
Fortilization	NT R lettiliser, according to need
rentilisation	
Verseliertier	Net we will deal
vernalisation	Not requirea.
Cultivation of seed mother plants	In 22 cm pots. Transfer into isolation greenhouses end of May
	40 plants
Effective population size	
	Isolation greenhouse
Pollination control	
	Wind pollination
Pollination method	
Conditions during seed ripening	In the greenhouse - during sunny periods temperature more than 30 °C.
<u></u> ggg	
	Brown to black coloured seeds are shattering. Seeds are harveste
Seed harvest procedure	by hand continuously.
Pre-processing of seeds	
The processing of seeds	
Threshing	
Threating	
Final processing	Signing by hand, air congrator, poliching
	Sieving by hand, an separator, polising.
Druing before storage	Three weeks at 20, 25 °C
Drying before storage	Three weeks at 20 - 25 °C.
Otanana	
Storage	Glass Jars at -15 °C - long term storage.
Germination test	No test available
Problems encountered/	
Remarks	

B.patellaris-POL	
	Measure
Seed preparation	Seed dressing
Sowing	End of March/ begin of April
	Into 8 cm pots, then transplanted into 12 cm pots, finally to the field or into
	larger pots.
Transplanting	
	NPK fertiliser, according to need
Fertilisation	
Vernalisation	Not required.
Cultivation of seed mother plants	In 22 cm pots. Transfer into isolation greenhouses end of May
	, , , , , , , , , , , , , , , , , , ,
	40 plants
Effective population size	
P = P = P =	
	Isolation greenhouse
Pollination control	
	Wind pollination
Pollination method	
Conditions during seed ripening	In the greenhouse - during sunny periods temperature more than 30 °C
<u> </u>	
	Brown to black coloured seeds are shattering. Seeds are harveste
Seed harvest procedure	by hand continuously.
Pre-processing of seeds	
g	
Threshing	
j	
Final processing	Sieving by hand, air separator, polishing,
Drving before storage	Three weeks at 20 - 25 °C.
Storage	Glass jars at -15 °C - long term storage
Germination test	No test available
Problems encountered/	
Remarks	