

Seed increase manual for Beta

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Site characteristics

Longitude:018000E
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

<i>B.vulgaris</i> subsp. vul.,bi-POL	
	Measure
Seed preparation	Seed dressing
Sowing	October, heated greenhouse
Transplanting	Into 8 cm pots, supplementary artificial light
Fertilisation	NPK fertiliser, according to need
Vernalisation	During winter at 4 to 6 ° C with 10 hrs supplementary light
Cultivation of seed mother plants	Directly planted into field plots end of April/ early May at 60 x 60 cm distance between plants
Effective population size	50 plants
Pollination control	Isolation greenhouse or spatial isolation in the field, then hemp is used as screen to prevent cross-pollination between accessions
Pollination method	Wind pollination
Conditions during seed ripening	Depends on the weather.
Seed harvest procedure	Starts when seeds skin colour of fruits of the upper third of the stem turns 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	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.vulgaris subsp. vul., an-POL

B.vulgaris subsp.vul., an-POL	
	Measure
Seed preparation	Seed dressing
Sowing	Depending on vernalisation requirement sowing starts February-March
Transplanting	Into 8 cm pots or small peat pots, 12/ 18° C, supplementary artificial light
Fertilisation	NPK fertiliser, according to need
Vernalisation	not required
Cultivation of seed mother plants	In 20 cm pots in the isolation greenhouse.
Effective population size	30 - 40 plants
Pollination control	Isolation greenhouse
Pollination method	Wind pollination
Conditions during seed ripening	Depends on the weather.
Seed harvest procedure	Starts when seeds skin colour of fruits of the upper third of the stem turns 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.
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	

Measure
Seed dressing
October, heated greenhouse
Into 8 cm pots, supplementary artificial light
NPK fertiliser, according to need
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
Depends on the weather.
Starts when seeds skin colour of fruits of the upper third of the stem turns to dark brown. Single plants are harvested depending on maturity.
Plants are dried at 20- 25 °C.
Threshing 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

B.vulgaris subsp.mar.,an-POL	
	Measure
Seed preparation	Seed dressing
Sowing	February, March in greenhouse
Transplanting	Into small pots.
Fertilisation	NPK fertiliser, according to need
Vernalisation	Not required.
Cultivation of seed mother plants	In 20 cm pots in greenhouses .
Effective population size	30 - 40 plants
Pollination control	Isolation in greenhouse compartment
Pollination method	Allogamous Species - wind pollinator
Conditions during seed ripening	During sunny periods temperature is higher than 30 °C.
Seed harvest procedure	Starts when seeds skin colour of fruits of the upper third of the stem turns 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	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

B.patula-POL	
	Measure
Seed preparation	Seed dressing
Sowing	February, March in greenhouse
Transplanting	Into small pots.
Fertilisation	NPK fertiliser, according to need
Vernalisation	Not required.
Cultivation of seed mother plants	In 20 cm pots in greenhouses .
Effective population size	30 - 40 plants
Pollination control	Isolation in greenhouse compartment.
Pollination method	Allogamous species - wind pollination
Conditions during seed ripening	During sunny periods temperature is higher than 30 °C.
Seed harvest procedure	Starts when seeds skin colour of fruits of the upper third of the stem turns 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	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.macrocarpa-POL

B.macrocarpa-POL	
	Measure
Seed preparation	Seed dressing
Sowing	February, March in greenhouse
Transplanting	Into small pots.
Fertilisation	NPK fertiliser, according to need
Vernalisation	Not required.
Cultivation of seed mother plants	In 20 cm pots in greenhouses .
Effective population size	30 - 40 plants
Pollination control	Isolation in greenhouse compartment
Pollination method	Allogamous species - wind pollinator
Conditions during seed ripening	During sunny periods temperature is higher than 30 °C.
Seed harvest procedure	Starts when seeds skin colour of fruits of the upper third of the stem turns 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	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.trigyna-6x-POL

B.trigyna-6x-POL	
	Measure
Seed preparation	Before sowing seedballs are soaked in concentrated I_2SO_4 4-5h, then washed in the 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 need
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
Problems encountered/ Remarks	Plant are vigorous and healthy. Seed production is almost without problems.

B.corolliflora-4x-POL

B.coroffiflora-4x-POL	
	Measure
Seed preparation	Before sowing seedballs are soaked in concentrated H_2SO_4 4-5h, then washed in the 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 need
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	Isolation in the field or in greenhouse
Pollination method	Allogamous species - wind pollination
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.
Problems encountered/ Remarks	Regular powdery mildew infections. Plant are vigorous and healthy. Seed production is almost without problems.

B.macrorrhiza-2x-POL

B.macrorrhiza-2x-POL	
	Measure
Seed preparation	Before sowing seedballs are soaked in concentrated H ₂ SO ₄ 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 need
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. Plants start flowering very early. In the field in the end of May.
Effective population size	20-30 plants
Pollination control	Isolation in the field or in greenhouse
Pollination method	Allogamous species - wind pollination
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.
Problems encountered/ Remarks	Regular powdery mildew infections. Low seed production.

B.lomatogona-2x-POL

B.lomatogona-2x-POL	
	Measure
Seed preparation	Before sowing seedballs are soaked in concentrated H ₂ SO ₄ 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 need
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	Isolation in the field or in greenhouse
Pollination method	Allogamous species - wind pollination
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.
Problems encountered/ Remarks	Low seed production. Small monogerm and bigerm seeds.

B.lomatogona-4x-POL

B.lomatogona-4x-POL	
	Measure
Seed preparation	Before swing seedballs are soaked in concentrated H ₂ SO ₄ 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 need
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
Problems encountered/ Remarks	Mono and bigerm seeds. Seed production is almost without problems.

B.procumbens-POL

B.procumbens-POL	
	Measure
Seed preparation	Seed dressing
Sowing	End of March/ begin of April
Transplanting	Into 8 cm pots, then transplanted into 12 cm pots, finally to the field or into larger pots.
Fertilisation	NPK fertiliser, according to need
Vernalisation	Not required.
Cultivation of seed mother plants	In 22 cm pots. Transfer into isolation greenhouses end of May
Effective population size	40 plants
Pollination control	Isolation greenhouse
Pollination method	Wind pollination
Conditions during seed ripening	In the greenhouse - during sunny periods temperature more than 30 °C.
Seed harvest procedure	Brown to black coloured seeds are shattering. Seeds are harvested 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

B.webbiana-POL	
	Measure
Seed preparation	Seed dressing
Sowing	End of March/ begin of April
Transplanting	Into 8 cm pots, then transplanted into 12 cm pots, finally to the field or into larger pots.
Fertilisation	NPK fertiliser, according to need
Vernalisation	Not required.
Cultivation of seed mother plants	In 22 cm pots. Transfer into isolation greenhouses end of May
Effective population size	40 plants
Pollination control	Isolation greenhouse
Pollination method	Wind pollination
Conditions during seed ripening	In the greenhouse - during sunny periods temperature more than 30 °C.
Seed harvest procedure	Brown to black coloured seeds are shattering. Seeds are harvested 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.patellaris-POL

B.patellaris-POL	
	Measure
Seed preparation	Seed dressing
Sowing	End of March/ begin of April
Transplanting	Into 8 cm pots, then transplanted into 12 cm pots, finally to the field or into larger pots.
Fertilisation	NPK fertiliser, according to need
Vernalisation	Not required.
Cultivation of seed mother plants	In 22 cm pots. Transfer into isolation greenhouses end of May
Effective population size	40 plants
Pollination control	Isolation greenhouse
Pollination method	Wind pollination
Conditions during seed ripening	In the greenhouse - during sunny periods temperature more than 30 °C.
Seed harvest procedure	Brown to black coloured seeds are shattering. Seeds are harvested 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	