Cardamom*(Amomum subulatum)*

Slips for vegetative propagation

1) Selection in the field: The planting slips should come from healthy disease free and high yielding mother plants from a field of specific variety. However repeated vegetative propagation reduces plant vigour and hence should be avoided. Moreover, vegetatively multiplied cardamom slips have the disadvantage that root and soil-borne diseases can be carried on into new plantations. This will not only reduce the productivity of the new plantations but may also carry risks for other crops.

2) Planting slip specifications: The cardamom slips or planting material should consist of rhizomes/bulbs/slips along with 1-2 numbers of one year old shoots or pseudostem.

3) Measurements: The minimum measurements of the planting slips would depend upon the variety (table) since some varieties are more vigorous and taller than others.

Minimum requirements for cardamom slips [1]

Variety	Diameter of rhizome (mm)	Diameter of pseudo-stem (mm)	Height of the planting slip (cm)	Nos of pseudo stems	Nos of leaves/ pseudo-stem
Bharlange	30-75 mm	5-17 mm	25-110 cm	1 and above	1 and above
Golsey	20-65 mm	5-15mm	20-100cm	1 and above	1 and above
Sawhney	30-75mm	5-15mm	25-100 cm	1 and above	1 and above
Ramsey	30-75 mm	5-17 mm	25-110 cm	1 and above	1 and above

[1]This measurements are tentative and are required to be confirmed from plant measurements. In the fourth column (height of the planting slips) height range is high because the slips are normally transported after cutting two thirds of the plant especially when transporting long distances to prevent from drying out during transportation.

4) Diseases: cardamom slips should be free from Foorkee and Chirkey viral diseases or any other diseases such as wilt, rotting and root knot. Special care should be given to check for any symptoms of root knot disease although they have not been reported in Bhutan so far.

4.2.25.2 Seeds for propagation

Since vegetative propagation has many disadvantages, the only option to obtain guaranteed disease free planting material is through seeds and tissue culture. The former is cheap and easy.

Plantation requirements

Plantation intended to be used for cardamom seed selection should be free from volunteer plants of other varieties and wild cardamom.

Field inspections

A minimum of three inspections is required: ie at flowering, during ripening and at maturity of capsules.

Field standards

Select well-matured seeds from healthy, disease free, high yielding individual plants from a uniform plantation of the specific variety. Minimum plantation/field size should be 1 acre. Seeds are viable for about 3-4 months after harvesting.

Seed standards

Parameters	
Germination (minimum)	30%
Pure seed (minimum)	98%
Inert matter (maximum)	1%
Other crop seeds (Max)	0.001%
Other variety seeds (max)	0.01

Weeds seeds (max)	0.01%
*Objectionable weed seeds (max)	0.01%
Seed moisture (Min for sowing immediately after harvest) air dried for 2 days	20%
Seed moisture (for spring sowing, minimum)	15-20%

**Objectionable weed seeds are wild cardamom*

Ginger (*Zingiberofficinale*Rosc)

There are about three types of ginger grown in Bhutan (variety unidentified) at present.

Seed rhizome standards

1. Should be labelled with the type and the source of the rhizomes.
2. Should be clean with no adhering soil particles.
3. Should not be sprouting or extensive shrivelling.
4. Should have 1-2 good undamaged buds.
5. Should be intact whole rhizomes with minimum of 30 gms weight.
6. should be free from any visible disease symptoms (rhizome and root rot)

Note: Excessively large rhizomes have high water content and hence susceptible to rot if stored for longer periods