##### PRT-CGN-PG-107B PROTOCOL FOR THE MULTIPLICATION of ONION and LEEK

This protocol applies to all parties involved in the multiplication of CGN material

**Introduction**

Multiplications have to fulfil minimum quality requirements to ensure maintenance of genetic identity and integrity (avoiding seed mixing among accessions and minimizing loss of diversity through genetic drift) and high seed quality (absence of diseases and sufficient germination ability).

Contamination with Genetically Modified Organisms (GMO) should be prevented.

*Any deviation from this protocol should be reported to CGN, after which it will be recorded by CGN in the Multiplication logbook (FOR-CGN-PG-002).*

**Multiplication**

Maintaining genetic integrity

* isolation
* All *Allium* species are crosspollinators. Accessions are therefore multiplied in isolation cages, isolation chambers or isolation tunnels. The plants are tied up such that no flowers touch the netting. Accessions of non-crossable species can be placed in the same isolation.
* Population size
* Multicplication is done on average on 100 plants ( at least 40 – 60 for cultivated species, 10 for wild species, 200 at most). This number may be changed if necessary, in consultation with CGN.
* In planting out, the required number of plants are chosen non-selectively from the population. However, plants that lag considerably behind in growth may be left out because their poor performance could mean that these plants eventually do not contribute to seed multiplication of the accession
* The number of plants that have been used in multiplication is recorded for every accession. These data are copied into the Multiplication logbook.
* sowing
* The number of seeds to be sown is determined by CGN. Possible dormancy or poor germination is taken into account. Advice on germination requirements and sowing time and method, sent by CGN, are being followed. Alternatively, methods used by multiplier may be used. If material germinates poorly or very slowly, these findings are recorded and copied into the Multiplication logbook.
* cultivation
* Cultivated *Allium* species are mostly biennial and need a vernalisation period while in adult stage.
* Wild species are mostly perennial.
* pollination
* Plants are isolated as soon as the plants develop flowering stalks. The plants are being pollinated by flies of bumblebees, which are placed in the cages/tunnels as soon as a few plants start flowering.
* harvest
* Even in case of low seed production, seed need to be sent to CGN.

Maintining identity

* Registration
* During sowing, cultivation and harvesting, accessions should be clearly marked with a label indicating the field number. All field numbers assigned prior to seed sowing should remain unchanged up to and including harvesting.

Maintaining seed quality zaadkwaliteit:

* Seed decontamination before sowing
* Prior to sowing, the seed should be decontaminated with permitted seed decontaminants.
* Inspection
* The crop should be inspected regularly. Pests and diseases are being treated and recorded and copied into the Multiplication logbook. When a pests or diseases might jeopardize proper multiplication of the seed CGN is notified.
* Seed treatment after harvest
* The method of seed cleaning is being decided in consultation with CGN.

**Concluding actions**

* Recorded deviations from this protocol should be sent to CGN along with the seed. These records are copied into the Multiplication logbook.
* Harvested seed is sent to CGN as soon as possible, in any case no later than six months after harvest. The seed bags are identified by their field number and their CGN number..