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Terms of reference for the purchase of equipment

August 2023

Invitation for a bid:

Project title: Construction and implementation of a new Cryobank - establishing the Center of Excellence in Crop Cryopreservation for Latin America hosted by CIP

Statement of work: Procurement and installation of a liquid nitrogen (LN) generator and a LN auto fill system

Dear Sirs,

The International Potato Center (CIP) invites you to submit a tender in competition, for the procurement and installation of a liquid nitrogen (LN) generator, a large capacity LN bulk tank and a LN auto fill system.

1. The Tender shall be delivered before closing time of the official working hours on August 31th, 2023.
2. The Tender shall be irrevocable for a period of sixty (60) days with effect from the latest date fixed for receiving Tenders.
3. Delivery and installation of the LN generator and LN auto fill system shall be completed by May 31, 2024.
4. Payment procedure will include a 30% advanced payment when the purchase order was placed by CIP, and a 70% upon the correct delivery, installation, and operation of the equipment
5. It can take up to fourteen (14) days to issue a transfer to a bank account after CIP has received the official original bill.
6. CIP will not be bound to accept the lowest tender nor to assign a reason for the rejection of any tender.
7. Scope of the project and specifications of the equipment are listed below within this document.

For any additional information, please contact: Nataly Aguilar at nataly.aguilar@cgiar.org and Copy Mr. Rainer Vollmer at r.vollmer@cgiar.org



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Project Summary and Objectives:

The International Potato Centre (CIP) has a genebank dedicated to the conservation of the genetic diversity of potatoes, sweet potatoes, and Andean roots and tubers, and is probably the largest of its kind worldwide. This diversity of crops is conserved in the medium term in cold rooms at -20°C (orthodox seeds of wild species) or under controlled and aseptic conditions of in vitro culture (cultivated species). For the long-term conservation of germplasm, the cryopreservation method is used at CIP, which consists of storing plant tissues, organs, or samples in the liquid or vaporous phase of liquid nitrogen (LN), inside special tanks (cryo-tanks) at ultra-low temperatures (-150°C to -196°C). The room in which the cryo-tanks containing the cryopreserved samples are stored is called a cryobank.

The CIP Germplasm Bank began operating its potato cryobank in 2013. A small room (20 m²) was conditioned for the storage of cryo-tanks and a LN generator with a production capacity of 20-30 liters of NL/day. Over the years, the number of cryopreserved samples steadily increased, and required the purchase of additional tanks. Currently, the CIP cryobank holds 6 large capacity cryo-tanks, 2 medium-sized tanks, 1 LN bulk tank (230 liters) and 1 LN generator. As a result of this growth, there is not enough space in the current cryobank, and the small LN generator produces not enough LN to fully cover the operational LN demand. Hence, it was agreed to construct a new and larger cryobank of about 80 m² (8 m x 10 m), with enough space to contain 18 high capacity cryotanks, 2 medium sized tanks, 1 small LN bulk tank (230 liters), 1 small LN generator (existing), 1 new high-capacity LN generator, as well as a LN auto fill system for the cryotanks. The new LN generator should have an average LN production of 150 liters per day and a peak production of minimum 160 liters per day. The new generator will be connected to an externally located LN bulk tank (min. 1750 liters), which in turn will supply LN to the auto-filling system of the cryo-tanks. Alternatively, LN can be dispensed directly from the bulk tank for filling smaller roller-based LN tanks (230-265 liters).

Considering that Peru is an earthquake zone, it is necessary that the installation of the LN generator, LN bulk tank and auto fill system are fulfilling highest safety standards. Preventive measures against potential risks of LN leaks, fire and inundation should be considered within the design, production, and installation phase of the equipment. A detailed maintenance plan, a minimum 24-month warranty on all compounds of the equipment, as well as a training course of CIP staff on maintenance of the LN generator, bulk tank, and auto fill system, should be considered.

The LN auto fill system should permit individual and serial filling of the cryotanks using a desktop computer as control center. Loss of LN during filling and pressurization of pipes and/or hoses should be minimized, and the filling speed of the tanks optimized. Highest safety and quality standards should be considered for all compounds of the auto fill system.

The fully implemented cryobank will have a total capacity for conserving >32000 accessions for the long-term, and hence, it will be one of the largest cryobanks for the conservation of plant genetic resources, worldwide. It will hold CIP's *in-trust* collections of potato, sweetpotato and other Andean Root and Tuber crops, as well as safety copies of cryo-collections of diverse crops of other countries from Latin America. In summary, CIP's new cryobank will be a keystone for safeguarding the agro-biodiversity of some of the most important food crops for future generations.

Specifications of equipment:

1. LN generator

- Minimum average production capacity of LN: 150 liters per day
- Minimum peak production of LN: 160 liter per day
- Water or air-cooled
- 3-phase 208-240 VAC, 60 Hz.
- Durable design with minimum maintenance requirements
- On wheels heavy
- Internal bulk tank of minimum 300 liter of LN
- Connected to external large capacity LN tank of minimum 1750 liter through a vacuum insulated connection
- Accomplishes highest quality and safety standards
- Minimum LN purity of > 99.0 %
- Minimum warranty of 24 months on all components of generator
- Includes spare part kit for first 24 months
- Remote control through desktop application
- Includes maintenance training course for CIP staff (operation and maintenance).
- LN generator fully installed and tested by the provider
- Should include detailed documentation on operation and maintenance (manuals of installation and operation)
- Automatically pour LN into cryogenic tanks.
- Maintenance plan.
- List of spare parts specifying part number (critical and non-critical).
- Mechanical, electrical, electronic drawing.
- List of components to calibrate detailing the ranges.
- Calibration plan.
- Installation, operation and performance report (IQ, OQ, PQ).
- Define software and hardware with ITU.
- Contingency plan before leaks and/or spills.



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2. LN bulk tank

- Minimum volume of 1750 liters of LN
- Equipped with disposal for quick internal pressure build up
- Connected to LN auto fill system (pipes, valves, hoses, etc.)
- Permits also direct dispensing of LN to smaller independent tanks (secondary outlet)
- Remote control through desktop application
- Low net evaporation rate
- Accomplishes highest quality and safety standards
- Includes maintenance training course for CIP staff (operation and maintenance).
- Requires coordination / meeting with the consultant who is updating the construction file for the new cryobank
- Tank fully installed and tested by the provider includes certification of inspection and testing of the tank and its components.
- Minimum warranty of 24 months on all components of the tank and the pipe system
- Should include documentation on operation and maintenance (manuals / plans)
- Maintenance plan.
- List of spare parts specifying part number (critical and non-critical).
- Mechanical, electrical, electronic drawing.
- List of components to calibrate detailing the ranges.
- Calibration plan.
- Installation, operation and performance report (IQ, OQ, PQ).
- Define software and hardware with ITU.
- Independent grounding protection system.
- Contingency plan before leaks and/or spills.
- LN level indicator in the tank.

3. LN auto fill system

- Vacuum insulated pipe system equipped with electro-magnetic cryogenic valves
- Tanks can be filled individually or serially (in line)
- Fully integrated system (Temperature and Level sensors)
- Should permit quick filling of tanks
- Low net evaporation rate of system
- Remote control through desktop application
- Accomplishes highest quality and safety standards
- Should include all necessary additional flasks, tanks, valves, pipes, etc. to guarantee smooth operations

- Includes maintenance training course for CIP staff (operation y maintenance).
- Requires coordination / meeting with the consultant who is updating the construction file for the new cryobank.
- System fully installed and tested by the provider
- Minimum warranty of 24 months on all components of the LN autofill system
- Should include documentation on operation and maintenance (manuals / plans)
- Certificate of inspection and testing of the pipes and their components.
- Maintenance plan.
- List of spare parts specifying the part number (critical and non-critical).
- Mechanical, electrical, electronic plan.
- List of components to calibrate detailing the ranges.
- Calibration plan.
- Installation, operation and performance report (IQ, OQ, PQ).
- Define software and hardware with ITU.
- Security system against seismic events.
- Contingency plan for leaks and/or spills.

In you offer please include:

1. Delivery time.
2. Payment terms
3. Catalogs
4. Incoterms CPT/CFR
5. Guaranty over equipment and parts

Note:

- Electronic and electrical components from **American origin is a plus.**
- The bidder must indicate the operating conditions of the equipment.
- Partial shipments are not allowed