	Packaging and Storage for NPGS “-18C” Backup Samples, PVP, JPR, and GMO Shipments		
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1. Introduction & Purpose

NLGRP receives seed from the National Plant Germplasm System (NPGS) which consists of 25 gene banks throughout the United States. We also receive seed from public institutions, non-governmental organizations, private companies and other agencies from all over the United States and around the world.

The packaging group is responsible for handling, packaging and storage of received seed.


2. Scope

The following instructions describe packaging and storage procedures for safety duplicate shipments that come from NPGS sites. These shipments contain either routine seed lots, critical backup samples or SOS samples (wild species). We also receive voucher seed samples for PVP and JPR. This SOP describes packaging for NPGS routine -18C storage shipments which include PVP, GMO, and JPR.

3. Definitions & Abbreviations

The following definitions and key terms are pertinent to this SOP:

Critical Backup	Backup samples containing small quantities of seed shipped to NLGRP already packed and sealed(usually in quantities of <500)
Germination Cards	Large Index-type card containing germination and viability data about an accession
Grey Screen	Describes Computer monitor view screen
GMO	Genetically Modified Organisms
GRIN-Global	Germplasm Resources Information Network
Hundred Seed Weight	The weight of 100 seeds (in grams)
JPR	Journal of Plant Registration
PVPO	Plant Variety Protection Office, Agricultural Marketing Service, USDA
SOS	Seeds of Success Program managed by USDOJ, Bureau of Land Management to save wild species

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4. Occupational Health & Safety

No Health & Safety issues have been identified for this procedure.


5. Materials and Equipment

Materials:

- Black Seed Storage Trays (Bottom dimensions are 22 in x 8.5 in wide x 5 in tall; Custom made to fit Space Saver Racks with curled lip for pulling and open holes for convenience of carrying.)
- White Label Tape
- Sticky Notes
- Scotch Tape
- Foil Seed Pouch, Unprinted, side-gusseted & laminated (Structure: 12pet/18foil/75LLDPE with a 522 adhesive and a 72 hour cure time. Pouch size 90MM X 266.5MM X 32MM.)
- V-Bottom Foil Seed Pouch, Unprinted, side-gusseted & laminated (Structure: 12pet/18foil/75LLDPE with a 522 adhesive and a 72 hour cure time. Pouch size 90MM X 266.5MM X 32MM.)
- 2-dimensional barcoded labels
- Germination Cards

Equipment:

- Heat Sealer STS-7
- Scissors
- Mettler Toledo Scale
- Ohaus Analytical Plus Scale
- Zebra ZM 400 Printer
- Computer with access to GRIN-Global, Keyboard, Mouse
- Cart
- Honeywell 3800g Barcode Scanner
- PAC Barrier Sealer Model: PB-G12

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6. Procedure for Packaging Standard -18C Backup Samples, JPR, PVPO or GMO Shipments

- 6.1** Priority for packaging: Trays with the oldest “Ready to Package” date are pulled first for packaging; excluding the PVPO, SOS, and JPR shipments which have the highest priority.
- 6.2** Check Room **223** “Ready to Package” cart for a tray of samples (order). Each tray has one or more tape labels with seed shipment information that will remain on the tray until the order is completely packaged.
- 6.3** Open the GRIN-Global curator tool using ARS email address as the user name and assigned GRIN-Global password. Password may be obtained from the IT unit.
- 6.4** The data base will complete an update. There will be a green status bar at the bottom of the screen showing the progress of the update.
- 6.5** Click to open the Check-In wizard.
- 6.6** Click the *Check-In* button. A drop down menu will appear with an option to enter Weight.
- 6.7** Click the *Weight* button for checking in regular seed, JPR, PVPO, or GMO.
- 6.8** There should be barcode labels in the tray with corresponding Germination Cards and samples. Place the label on a standard Foil Seed Pouch for smaller seed or a V-bottom Foil Seed Pouch for larger seed, a little lower than halfway down the bag size. V-bottom bags are factory heat sealed in a “v” shape which allows the bag to expand and stand upright in storage.
- 6.9** Scan the barcode label on the Foil Seed Pouch for that sample. GRIN-Global will take a couple of seconds to load the barcode information.
- 6.10** Enter the sample weight information.
- 6.11** Pour the entire sample onto the Mettler Toledo scale.
- 6.12** Put 10 or 20 seeds (depending on size) onto the Ohaus scales. For smaller seeds, use 20 seeds (e.g. Tobacco) or 10 seeds for larger seeds. (e.g. Peanuts)
- 6.13** Wait for the “S” (stable) to appear on the Ohaus scale with the weight measurement.
- 6.14** Press the print button on the Ohaus scale to send the seed weight into *Known Weight* field of the Grin-Global program.
- 6.15** Empty 10 or 20 seeds from the Ohaus scale back into the Mettler Toledo scale.
- 6.16** Press the print symbol on the Mettler Toledo scale to send the *Total Sample Weight*, *Total Seeds*, and *Hundred Seed Weight* information to the Grin-Global program. The



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GRIN-Global database calculates these weights based on the seed amount and weight entered during the first weight measurement.

6.17 The Cold Vault is set up with Black Trays pre-labeled to show their location. Empty trays for routine -18C storage are located in Cold Vault Room **300**. Keep extra trays in the lab for later use when the original tray is full or select a partially filled tray in Cold Vault Room **238** to completely fill it. Click on the *Location* field in GRIN-Global and scan the location from the Black Tray (Ex. R072-02-A08). Once the location has been scanned the GRIN-Global database will keep that location in the selected field until a new location has been scanned.

- For PVPO shipments, select an empty tray, a partially filled PVPO tray located in Room **238**, or a partially filled PVPO tray located on the *Ready to Package* cart in Room **223**. Under the handle there will be a piece of white tape with “PVPO” printed in all capital letters. These trays must always be labeled PVPO. Fill that tray until full. At the end of the day if the tray is not full it may be kept in Room **223**. At the end of the week put trays in the cold vault in the specified location designated by the tray number.
- For GMO shipments, select an empty tray, a partially filled tray located in Room **238**, or a partially filled PVPO GMO tray located on the *Ready to Package* cart in Room **223**. These trays are labeled with orange GMO labels and white PVPO labels. Fill that tray until full. At the end of day, if the tray is not full it may be kept in Room **223**. At the end of the week put trays in the cold vault in the specified location designated by the tray number.

6.18 Press the *Save/Print* button on the program.

6.19 A pop up window will ask for a serial number. Scan the serial number label from the Foil Seed Pouch to print and to save to GRIN-Global.

6.20 Pour seeds from Mettler Toledo scale back into the Foil Seed Pouch. Cut seed information with scissors from the original seed packet and put in Foil Seed Pouch with seed.


6.21 The *Location* label and *Germination Card* label will print from the Zebra printer.

6.22 Stick *Location* label above the *Serial Number* label on the Foil Seed Pouch.

6.23 Stick the *Germination Card* label on the lower right side of the *Germination Card* under the *STAT CMT* field of the card.

6.24 Click the *Next Weight* field to go on to the next sample.

- All trays no matter what designation (JPR, PVPO, etc...) should have samples put in serial number order (from smallest to largest) starting at the left front

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side of the tray working from the front to back. Repeat on the right side of the tray.

- Any samples not labeled PVPO or GMO can be combined in a tray that will go to Room **300**. If sample is labeled PVPO, it can only go in a PVPO designated tray. If the sample is labeled GMO, it can only go in a PVPO GMO designated tray.

6.25 At the end of the day click *Done*. Look at the data to confirm accuracy. Click Yes at the prompt to save data to the GRIN-Global program.

6.26 A grey screen will appear on the monitor showing new samples scanned (may take a while to load if many samples were checked in).

6.27 Once screen has popped up showing the new samples, click on the *SAVE* button.

6.28 A pop-up window will appear to indicate that the *SAVE* has been successful.

6.29 Close the program to complete.

6.30 When orders are fully checked in and no more samples need to be checked in for that order place labeling tape with information (from front of the tray) on **Greg’s** desk for further processing.

6.31 At the end of the day place tray in Room **223** on a 3 tiered cart to store until the end of the week, then take to designated Cold Vault room and location.

6.32 At end of the week put the regular/conventional trays (those not marked with PVPO or GMO) in Cold Vault Room **300** in the location designated by tray label. Put PVPO and/or GMO trays in Cold Vault Room **238** in location designated by tray label.

Note: PVPO or Cryogenically stored samples that fail the LN2 exposure test are packaged as conventional samples. Print a new serial number label since the number 5 in the suffix (that designates this as a cryo-sample) will have been changed to a 0 (zero). Cover the existing barcode at the bottom right of the germination card.

7. *Related Documents, flowcharts and Links*

The following **flowchart** ([provide links](#)) are pertinent to this SOP:

8. *Staff Training and Competency*

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9. *Infrastructure & Work Environment (I&WE)*

Laboratory workers are required to wear closed toe shoes.



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10. Proactive Management

11. References

12. Revision History

Effective Date of the SOP	Version #	Description	Reviewed By

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