

# **Protocol for Managing “Novel” Plants at the Department of Plant Science, University of Manitoba**

December 2022 Version

## Background

Canada is unique in the world in that the Canadian Food Inspection Agency (CFIA) regulates plant research and development based on “Novelty” rather than on method of development.

Plants with a “Novel” trait (PNT’s) are defined:

- The new trait is not present in stable, cultivated populations of the plant species in Canada
- The trait in the plant species is present at a level significantly outside the range of that trait in stable, cultivated populations of that plant species in Canada

<http://www.inspection.gc.ca/plants/plants-with-novel-traits/general-public/fact-sheets/overview/eng/1337827503752/1337827590597>

Alternatively, the CFIA defines a plant with a “Novel” trait (PNT) as a new variety of a species that has one or more traits that are “Novel” to that species in Canada. A trait is considered to be “Novel” when it has both of these characteristics:

- It is new to stable, cultivated populations of the plant species in Canada and
- It has the potential to have an environmental effect

<http://www.inspection.gc.ca/plants/plants-with-novel-traits/general-public/fact-sheets/novelty/eng/1338181110010/1338181243773>

The CFIA considers all genetically engineered plants to be PNT’s. In addition, the CFIA stipulates that plants developed using mutagenesis, cell fusion and traditional breeding can result in a plant that is considered by CFIA to be a PNT.

There are three stages in the development of PNT’s in Canada:

1. Complete containment of the PNT to the lab or controlled environment facilities
2. Confined field trials of the PNT regulated by the CFIA
3. Unconfined release into the Canadian environment approved by CFIA

There are two types of PNT’s in Canada: 1) new PNT’s in development stage 1 or 2 where containment or confinement is required and; 2) PNT’s which have been approved by CFIA for unconfined release into the Canadian environment for which no special management is required.

The protocol outlined in this document refers to PNT’s in development stage 1 – that is, new PNT’s that must be completely contained to the lab or controlled environment growth facilities.

**The objectives of the protocol for managing “Novel” plants at the Department of Plant Science, University of Manitoba are:**

- Achieve complete containment of the “Novel” trait gene(s) to PNT’s grown in the lab or controlled environment facilities by
- Avoiding any inadvertent release into the environment of live PNT tissues or seeds
- Avoiding any inadvertent cross pollination between PNT’s growing in the lab or controlled environment facilities and other non-PNT’s growing in the lab or controlled environment facilities

**PNT Guidelines and Staff and Student Training Protocols**

This document is to serve as a guideline for the management and handling of development stage 1 PNT’s in the Department of Plant Science, University of Manitoba. The information included in this document will also become an integral part of the **annual safety seminar** and the Department. Furthermore, any new student or staff member joining the department will be responsible for reading and understanding the PNT management protocol below.

**General care**

- Clear and complete recording of where and when the plants with a “Novel” trait (PNT’s) are created, maintained and disposed of is required. This includes individual lab and controlled environment facility records. There is a Sign-in sheet on the PNT bench for controlled environment facility records which needs to be filled with all the necessary information regarding PNTs.

**Maintenance of PNT’s in the laboratory**

- Regeneration and selection of all PNT’s should only be conducted in designated locations.

**Maintenance of PNT’s in controlled environment facilities**

- PNT’s should only be grown in designated controlled environment locations. These will be specified in consultation with the controlled environment supervisor for the Department.
- In cases when controlled environment space is limited; a researcher may grow both type 1 PNT’s and non-PNT’s in the same area, in clearly designated and on well separated benches in a growth environment over which the researcher has complete control, and any PNT type 1 materials must be temporally separated in its reproductive phase of growth.
- Unless it is necessary, access to controlled environment locations where PNT’s are being grown will not be permitted to unauthorized users.
- Controlled environment staff must be informed of the presence of PNT’s being grown in the Department’s controlled environment facilities.
- All PNT’s must be **clearly labeled** as PNT’s
- PNT’s grown in the Department’s controlled environment facilities should be monitored on a daily basis to ensure that they are not moved beyond the assigned space.
- Prior to flowering/heading, all flowering portions of PNT’s must be bagged to prevent pollen dispersal.

**Harvesting and storage of novel plants**

- Seeds from PNT’s should be harvested at a time point that avoids any seed shattering.

- Threshing and cleaning of PNT's should only be done using equipment and locations dedicated for this purpose. Greenhouse has a designated desk space (Bench #4 by the west entrance to the greenhouse complex) for working with PNTs which has been clearly marked by all orange signs/stakes.
- The personnel handling or managing PNT's should ensure that no seeds are attached to their clothes or shoes.
- Any seed harvested from novel plants should be kept in sealed bags, labeled clearly and stored in designated locations. Bags should be labeled with orange tape.

#### **Maintenance of controlled environment facilities used to grow PNT's**

- All materials derived from PNT's such as senesced leaves and harvesting residue must be collected and disposed of as described below.
- Controlled environments used to grow novel plants should be cleaned thoroughly after harvesting using designated cleaning detergents.

#### **Disposal of materials derived from PNT's**

- All PNT material for disposal should be bagged in a clear autoclavable bag and labelled clearly with Hazardous material orange stickers available on PNT bench until autoclaving. This must be performed in the designated PNT growing area.
- PNT bags should be sealed, never left open on controlled environment benches or floors or in common spaces.
- Bagged PNT materials should be transported for autoclaving with utmost care.
- Before autoclaving, make sure that bags are sealed tight enough to restrict escape of any material, but loose enough to allow steam or airflow.
- Plant materials derived from PNT's should be autoclaved for an hour at 121°C, 15 psi.
- When necessary, soils and pots used to grow novel plants should be autoclaved prior to disposal. Bags should be labeled with orange tape.
- When applicable, pots that have been harvested should be retained in the same spot and watered for two weeks to germinate any seed that may have shattered. Any emerging seedlings should be collected and autoclaved as described above.
- Trays, sticks and any other reusable materials should be thoroughly cleaned and if necessary bagged and autoclaved prior to reuse.
- Autoclaved plant materials and soils may be disposed of in the regular trash stream.

#### **Annual review and update**

- This protocol will be reviewed annually and updated as required.

#### **Academic staff member contact**

- The Department Head will assign one of the academic staff members in the Department as a contact person for any questions regarding the protocol and to coordinate its annual review.

Additional information can be found in the following CFIA web link:

<http://www.inspection.gc.ca/plants/plants-with-novel-traits/general-public/eng/1337380923340/1337384231869>

The PNT Management and Handling Committee  
**December 12th, 2022**