

# Best Management Practices for Use of Transgenic Plant Materials in Greenhouses

## Rationale

Cornell Greenhouses may be used for research on transgenic plant materials. Transgenic plant materials are defined as plants and plant-associated organisms containing recombinant or synthetic nucleic acid molecules r/sNA DNA (rDNA). These materials may require special procedures to ensure that they are not released to the environment. Licensed commercially available transgenic plant materials are not included under this BMP and their use in Cornell greenhouses is not restricted.

Other types of plant materials, for example select agents, may require similar or more extensive management practices but are not covered under this BMP.

The intent of this BMP is to provide the Cornell greenhouse community with the general guidelines and practical methods necessary to work with transgenic plant materials safely and in accordance with university and national guidelines.

**Environmental Principle:** Environmental impact is reduced when transgenic organisms are handled properly to prevent them from entering the environment.

Operational Aspects	Environmental Assurance >>		
	Level 1	Level 2	Level 3
<b>Overview</b>			
Emergency Preparedness	staff and facility users are educated on proper procedures for working with transgenic plant materials as defined and approved by the Cornell Institutional Biosafety Committee (IBC) in accordance with the National Institutes of Health Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules (NIH Guidelines); emergency contact information is posted; greenhouse staff report transgenic release to greenhouse supervisor or manager immediately	staff and facility users educated on proper transgenic procedures as defined and approved by the Cornell IBC in accordance with the NIH Guidelines; emergency plan is in place and contact information is posted; greenhouse staff report transgenic release to greenhouse supervisor or manager immediately	staff and facility users educated on proper transgenic procedures as defined and approved by the Cornell IBC in accordance with the NIH Guidelines; emergency plan is in place and contact information is posted; greenhouse staff report transgenic release to greenhouse supervisor or manager immediately; where practical staff will contain/stop release

Operational Aspects	Environmental Assurance >>		
	Level 1	Level 2	Level 3
Environmental Awareness	staff are made aware of implications to surface and groundwater from release of transgenic materials into the environment	staff are made aware of implications to surface and groundwater from release of transgenic materials into the environment	staff are made aware of implications to surface and groundwater from release of transgenic materials into the environment
Training	all employees are made aware that there are special procedures for transgenic materials in plant growth facilities and not to enter a greenhouse containing transgenic materials without specific training	all employees are made aware that there are special procedures for transgenic materials in plant growth facilities and not to enter a greenhouse containing transgenic materials without specific training; staff working with transgenic plants are trained in the basic transgenic procedures and practices and are familiar with the greenhouse manual portion of the MUA	all employees are made aware that there are special procedures for transgenic materials in plant growth facilities and not to enter a greenhouse containing transgenic materials without specific training; all staff are trained in the basic transgenic procedures and BL2P practices and are familiar with the greenhouse manual portion of the MUA
Communication	project personnel provide greenhouse supervisors with the greenhouse manual from their project Memorandum of Understanding and Agreement (MUA); the greenhouse manual is available to greenhouse staff	project personnel provide greenhouse supervisors with the greenhouse manual from their project MUA The greenhouse manual is provided to greenhouse staff	project personnel provide greenhouse supervisors with the greenhouse manual from their project MUA; greenhouse supervisors ensure that appropriate staff receive specific training; the greenhouse manual is provided to greenhouse staff; greenhouse supervisors have access to project MUAs
<b>Management</b>			
Signage	signs based on the IBC sign template are posted on all doors to spaces containing transgenic material	signs based on the IBC sign template are posted on all doors to spaces containing transgenic material; greenhouse supervisors facilitate posting of required signage	signs based on the IBC sign template are posted on all doors to spaces containing transgenic material; greenhouse supervisors provide a copy of the IBC template to facility users; greenhouse supervisors facilitate posting of required signage

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<b>Handling</b>			
Mixed populations of transgenic and non-transgenic plants in a greenhouse	facility users and greenhouse staff follow IBC policy and NIH Guidelines regarding comingling of non-transgenic, BL1P and BL2P plants	facility users and greenhouse staff follow IBC policy and NIH Guidelines regarding comingling of non-transgenic, BL1P and BL2P plants	facility users and greenhouse staff follow IBC policy and NIH Guidelines regarding comingling of non-transgenic, BL1P and BL2P plants
<b>Safety</b>			
Prevention of Biological & Chemical Exposures	staff, users and visitors are made aware of any safety hazards through appropriate communication and necessary training associated with greenhouse projects; information meeting all Hazardous Communication requirements is provided	staff, users and visitors are made aware of any safety hazards through appropriate communication and necessary training associated with greenhouse projects; information meeting all Hazardous Communication requirements is provided	staff, users and visitors are made aware of any safety hazards through appropriate communication and necessary training associated with greenhouse projects; information meeting all Hazardous Communication requirements is provided
<b>Regulatory Protocols</b>			
Containment	meets requirements from MUA and NIH guidelines	meets basic requirements from MUA and NIH guidelines	meets basic requirements from MUA and NIH guidelines
Disposal	meets requirements from MUA and NIH guidelines	meets basic requirements from MUA and NIH guidelines	meets basic requirements from MUA and NIH guidelines
Transportation	meets requirements from MUA and NIH guidelines	meets basic requirements from MUA and NIH guidelines	meets basic requirements from MUA and NIH guidelines

**Resources:**

- National Institutes of Health (NIH) Guidelines <https://osp.od.nih.gov/biotechnology/nih-guidelines>
- Information Systems for Biotechnology (ISB) Practical Guide to Containment Plant Biosafety in Research Greenhouses <http://www.isb.vt.edu/Containment-guide.aspx> (Virginia Tech)
- Cornell University Agricultural Experiment Station (CUAES) Restricted Experiment sign

- **Institutional Biosafety Compliance (IBC) Service Plant Containment Resources**  
<http://www.ibcservices.com/Pages/PlantResources.aspx>
- **AgBioForum “US Regulation of Agricultural Biotechnology: An Overview**  
<http://www.agbioforum.org/v3n4/v3n4a15-belson.htm>
- **Cornell Institutional Biosafety Committee (IBS)** <http://www.ibc.cornell.edu>
- **Cornell IBC Sample Greenhouse Manual** <http://www.ibc.cornell.edu> *Go to investigator resources / Guidance documents*
- **Cornell IBC Sign Template** <http://www.ibc.cornell.edu> *Go to investigator resources / Forms and Signage*