

For more
information on
working with
transgenic plants:

A Practical Guide to Containment

http://www.isb.vt.edu/greenhouse/green_man.intro.cfm

NIH Guidelines for Plant Research

[http://www4.od.nih.gov/oba/rac/guidelines_02/
Appendix_P.htm](http://www4.od.nih.gov/oba/rac/guidelines_02/Appendix_P.htm)

USDA/APHIS

<http://www.aphis.usda.gov/subjects/biotechnology/>

Arabidopsis Information

<http://www.arabidopsis.com/>



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Transgenic Plant Containment for Laboratories, Growth Chambers, and Greenhouses

University of Kentucky
Department of Biological Safety



Elements of Containment



The goal of biosafety with regard to transgenic plants is to prevent dissemination of the modified species outside the growing area. Containment is crucial in transgenic plant research in the labs, greenhouses, and growth chambers. Field trials with transgenic plants require compliance with USDA regulations. Please consult the USDA guidelines for containment requirements. This pamphlet provides information for transgenic plant and seed containment. Individual research projects will require different containment procedures based upon the experiments performed.

The goals of transgenic plant containment are:

- Prevent interbreeding with native species
- Transgenic plant waste must be decontaminated or inactivated prior to disposal
- Contain species that could detrimentally impact local and agriculturally important species
- Control insect vectors
- Contain seeds and pollen.

All researchers working with transgenic plants must register with the IBC, determine the appropriate biosafety level for their work, and have standard operating procedures in place for:

- Storage, transport, and handling of transgenic seeds and plant materials
- Labeling and segregation of transgenic and non-transgenic plant materials
- Preventing release of transgenic seed to the environment
- Preventing dissemination of genetic material to the environment

Storage, transport, and handling of transgenic seeds and plant materials

Transgenic seed should be stored in a locked cabinet located preferably in or near the greenhouse or growth chamber. When stored or handled outside of a confined space, such as on a lab bench or potting bench, seed should be in a spill-proof container. White paper can be utilized on lab benches in conjunction with a tray to allow for easy identification and containment of stray seeds.



White paper and trays can assist in containing transgenic seed on the lab bench.



Labeling and segregation of transgenic and non-transgenic plant materials

All transgenic seeds and plants should be clearly identified and labeled to distinguish them from other stored seeds, plants, or materials. If transgenic and nontransgenic plants must be grown in the same location, such as an open lab or mixed use greenhouse, all work must be completed at the biosafety level approved for the transgenic plant work.



Transgenic plants should be clearly labeled to distinguish them from non-transgenic plants.

Preventing release of transgenic seed

Seed is easily tracked out of facilities on shoes and this inadvertent dissemination can be easily prevented through the use of shoe covers and/or sticky mats. Seed is also easily carried out of facilities on clothing and this can be prevented with the use of disposable lab gowns that are dedicated for use in the plant growth chamber or greenhouse. Good housekeeping practices can help prevent

release of transgenic seed by keeping loose seed off the floor. Daily use of a Swiffer can be an easy way to remove loose seed from floors.



Shoe covers, sticky mats, isolation gowns, and Swiffers help prevent release of transgenic seed.

Preventing dissemination of genetic material

Growing plants need to be contained to prevent the dissemination of genetic material. This can be achieved by covering or removing flower and seed heads to prevent seed dispersal, harvesting plant material prior to sexual maturity, or utilizing male sterile lines. Various commercial containment systems are available or inexpensive systems can be constructed with disposable plastic sheeting. These systems contain seeds, soil, plant parts resulting in less housekeeping and less contamination between shelves. These systems also provide better humidity control resulting in less watering of plants.



There are many containment systems available for transgenic plant research.

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