

This study is a work in progress to determine the effects of gamma radiation on *Arabidopsis thaliana*, the model plant system for plant biologists. The objective is to evaluate plant physiological processes to determine the suitability of this species as *in situ* dosimeter. This could assist in the determination of radiation exposures in accidents and planned environmental releases. *Arabidopsis* was selected for its rapid life cycle and well known physiology. Plants will be irradiated with five doses of gamma radiation (50rad, 500rad, 5krad, 15krad, and 40krad) at each of four growth stages: cotyledons fully open, 3 rosette leaves open, 10 rosette leaves open, and appearance of first flower buds. An un-irradiated control group will be maintained for each plant growth stage. Static and dynamic examination of physiological processes will be performed to evaluate the radiation effects on plant growth. The static measures at end of the flowering stage will include total biomass, root:shoot ratio, leaf area, average internode length, and height. The dynamic measures will examine rates of respiration and photosynthesis before irradiation and every five days after irradiation.