Evaluation Items	Indonesia	Malaysia	Thailand
1. The selection of Starting breeding Materials. - Whether it was appropriate or not.	*D.* 'Sonia 17 Red' and *D.* 'Jayakarta', were selected for starting breeding materials.	*D.* 'Sonia 17 Red' and *D.* 'Jayakarta' , *D. mirbellianum*, were selected for starting breeding materials	*D.* 'Sonia 17 Red' and *Dendrobium*. 'Sonia Earsakul' were selected for starting breeding materials
2. The determination of culture methodologies - Tissue culture of clones, and Isolation and multiplication of selected mutant clones.	*D.* 'Sonia 17 Red' PLBs were obtained from Thailand. The PLBs of *D.* 'Jayakarta' were initiated on modified Vacin and Went medium enriched with charcoal. This work was conducted at the tissue culture laboratory of CRDIRT.	*D.* 'Sonia 17 Red' and *D.* 'Jayakarta' PLBs were obtained from Thailand and Indonesia respectively. Standard orchid culture techniques are followed. For *D. mirbellianum* the protocorms were initiated from selfed flower. It is difficult to categorize the vegetative stages of the proliferating protocorms after the irradiation treatment.	Young shoots from healthy plants were collected from commercial orchid nurseries for tissue culture. -The lateral buds and terminal buds were excised from sterile shoots and cultured in liquid Vacin-Went medium. -After 2 months under agitation condition, explants produced mass of protocorm like bodies (PLBs). The PLBs were multiplied in liquid medium and transflask to solid medium for PLBs multiplication.(4 months)
3. Irradiation to Starting Materials. - The determination of the methodologies, e.g. optimum dose, radiation sensitivity, etc.	PLBs of *Dendrobium* 'Sonia 17 Red' from Thailand were irradiated with acute gamma irradiation at doses 0, 30, 70, 80, 90 and split dose 70 + 30 Gy. The cultures of 30, 70, 80 and 70 + 30 Gy showed better performance although their growth was slower compared with untreated cultures. The culture with the dose 90 Gy showed rosette and pale leaf color. These works are conducted at the tissue culture laboratory of CRDIRT and IOCRI.	PLBs of *Dendrobium* 'Sonia 17 Red' from Thailand were irradiated with acute gamma irradiation at doses 0, 30, 70, 80, 90 Gy. *D.* 'Jayakarta' was irradiated with acute gamma ray at 30 Gy and split doses (10 + 10 + 10 Gy). The dose was selected based on data of previous study. *D. mirbellianum* protocorms were irradiated with acute gamma ray and ion beam. However it is difficult to accurately determine LD50. For ion beam irradiation the doses used were, 0, 0.2, 0.4, 0.8, 1.0, 2.0, 4.0, 6.0, 8.0, 10.0, 12, 15, 20, 30, and 50 Gy. Protocols for gamma and ion beam irradiation have been established for *Dendrobium* protocorms	The PLBs were irradiated with gamma rays;- Phase I : *Dendrobium* 'Sonia No.17 red' Acute gamma rays 0,60,70,80,90,100 Gy *Dendrobium* 'Sonia Earsakul' High dose acute gamma rays 0,60,70,80,90,100 Gy Low acute gamma rays 0,2,4,6,8,10 Gy Split dose acute gamma rays 0,20,20+20,40 Gy Chronic gamma rays 0 , 400, 800 Gy Results: growth retardation was observed but it is not possible to determine the optimum dose from the current results. Phase II : *Dendrobium* 'Sonia No.17 red' and *Dendrobium* 'Sonia Earsakul' · *In vitro* seedlings Chronic gamma rays 50, 50+50, 100+50, 100+100, 200+100 All of seedlings were grew in nursery for 6 months. · PLBs Acute + Split dose chronic gamma rays 0 + 50 + 50 10 + 50 + 50 20 + 50 + 50 30 + 50 + 50
4. Selection of Mutants Clones with Insect Resistance. - Establishment of screening technique.	Screening techniques have not been established.	In vitro screening method has been developed. Preliminary results have shown that up to 28% of the irradiated plantlets and 14% of the control plantlets were able to survive after 3 months infestation with mites, however a better and more efficient screening method is still needed.	Selection of insect resistance mutant clones with natural infestation techniques. Seedlings of each treatment were grown in nursery without application of insecticide and fungicide. During four months under natural infestation of thrips, 0-17.4 % of seedling damaged by thrips and up to 67.27-92.31 % after 10 months of the experiment.

5. Testing and Evaluation of Selected Mutants in the field. - The data of field trials and estimate of their ability.	The project has not reached field trial stage yet.	The project has not reached field trial stage yet.	The thrips damaged and non-damaged seedlings were grown to flower in nursery. The screening technique for selection of thrips tolerance on flowers will be conducted under natural and artificial infestation.
6. Other result and ripple effects of the project, if there are.		Training for junior researchers in mutagenesis technology, introduction of new technology (ion beam irradiation). The technology and techniques developed can be extended for the improvement of other important crops.	Workshop on plant resistance to insects was organized for trainees from Malaysia and Thailand. A scientific TV programme was made on the nuclear technology applications in orchid research in Thailand by Japanese. A good awareness of the technology has been created in the orchid industry. The industry has shown great interests and at least two companies have utilized the technology for orchid improvement.
7. Opinion about the project (problems, ideas, remarks, proposal, etc.)	Mass rearing of thrips for the selection of tolerant mutants is needed. It is very difficult and requires much effort and fund. Collaboration with other research institutes and universities in conducting the research activities is needed due to limited fund for the implementation of the project.	Mass rearing of thrips for the selection of tolerant mutants is needed. It is very difficult and requires much effort and fund. Lack of funding, three varieties are too many to work on at one time.	Mass rearing of thrips for the selection of tolerant mutants is needed. It is very difficult and requires much time, effort and fund. Additional funding is needed as the current funding is finished at the end of October 2005.