行政院及所屬各機關出國報告
（出國類別：出席國際會議）

參加『亞太種子協會』第廿一次執行委員會議

服務機關：行政院農委會農業試驗所
出國人職　稱：所　長
姓　　名：林 俊 義

出國地點：泰國・曼谷

出國期間：九十年三月十四日至三月十七日

報告日期：九十年五月

目　錄

壹、目的

『亞太種子協會』為非營利性與非政府性之國際組織，目的在促進亞太地區種子與種苗之生產及貿易，由聯合國糧農組織支持於民國八十三年成立，總部設於泰國，僅接受政府機構或公私營利種苗公司為會員，目前有四十餘國約三百單位會員，該協會於八十六年九月廿五日於澳洲舉行年會，會中推選筆者為執行委員，任期三年，執行委員相當於我國各種協會中之理事，其任期為三年（一九九七至二〇〇〇年），筆者因在協會中負責各項種子技術之訓練及推廣，任技術委員會之委員，稍有貢獻，受協會各會員之推舉，再次獲選為代表政府機構之執行委員，任期三年（二〇〇一至二〇〇四年）。執行委員會原則上每半年召開一次，必要時得召開臨時會。本次出國即為受邀參加二〇〇一年之第一次執行委員會議，會議在曼谷召開，共舉行兩天。

貳、內容與心得

一、討論FAO（國際糧農組織）對APSA工作執行結果之建議改進事項，其中包括會員之徵求、對於雜誌內容的修改、每年定期大會的改進、研討會品質之改進以及APSA內職員薪水之增加意見等，共提出四六點修正及建議事項。會中逐一討論。

二、APSA報告協會半年來之各項工作執行情形，包括：

1.討論上次執行委員會議之執行狀況。

2.執行技術委員會各項建議情形。

3.出版亞洲種苗雜誌第六卷第一期。

4.討論協會之預算及決算情形。

5.討論協會會員入會、退會及會員繳交會費之情形。

6.討論二〇〇一年六月在台灣農業試驗所與亞太糧肥中心合作之『生物技術在種子與種苗應用之研討會』之內容與行程。(附件一)

7.討論二〇〇二年與我國農業試驗所、亞太糧肥中心合作在菲律賓舉行之『種苗生產技術』研習會之內容。

三、討論二〇〇一『亞洲種子年會』事宜，經執行委員會討論確定如下：

1.地點：日本・千葉。

2.時間：二〇〇一年九月十八日。

3.預定參加人數約五〇〇位會員。

4.註冊費：會員三五〇美元、非會員七〇〇美元、地主國代表三〇〇美元。

5.會議行程如後：

(1)第一天：九月十六日

九：〇〇～十七：〇〇　報名。

(2)第二天：九月十七日

八：〇〇～十七：〇〇　報名。

八：〇〇～十七：〇〇　展覽會佈置。

八:〇〇～十二:〇〇　委員會討論。(智慧財產權、國際貿易與檢疫)

十三：三〇～十七：〇〇　執行委員會議。

十三：〇〇～十七：〇〇　會員商業交談。

十七：〇〇～廿一：〇〇　歡迎晚宴。

(3)第三天：九月十八日

八：〇〇～十八：〇〇　種苗展覽、展示、商業聯誼。

八：三〇～一〇：三〇　亞太種苗協會大會並選舉新執行委員。

十一：〇〇～十二：〇〇　分組討論：日本園藝作物之育種技術近況。

十三：三〇～十四：三〇　日本政府對私人種苗機構之輔導。

十四：三〇～十五：三〇　日本種苗企業發展概況。

(4)第四天：九月十九日

八：三〇～十七：〇〇　專業小組會議。

八：三〇～一〇：〇〇　蔬菜小組會議。

十三：三〇～十五：〇〇　雜交水稻小組會議。

十三：三〇～十五：〇〇　研究發展小組。

十七：〇〇～　晚宴。

(5)第五天：九月二十日

九：三〇～十二：〇〇　亞太種苗協會會員大會。

a.理事長報告。

b.財務報告。

c.預算報告。

d.協會章程修訂。

e.執行委員選舉。

十四：〇〇～十六：〇〇　執行委員會議。

(6)第六天：九月廿一日

田間參觀。

參、行程

九十、三、十四　台北～曼谷　啟程

九十、三、十五　泰國曼谷 出席 APSA 執行委員會年中會議。

九十、三、十六　泰國曼谷 出席 APSA 執行委員會年中會議。

九十、三、十七　曼谷～台北　返程

肆、建議事項

一、亞太種苗協會約有三百個會員，多為各國具有規模的種子公司或種苗協會參與，每年不僅舉辦會員大會，討論當前重要種苗發展事宜，各種苗商亦趁此機會展示他們的重要新產品，以擴展他們的種苗事業之版圖。並且藉此時機做商業交談，不僅廠商之間可交換知識，亦可達成買賣交易的行為。因此，建議政府單位應鼓勵我國種苗廠商多參與此盛會，以達成獲取新知及出售種子的機會。今年預定於九月十六至廿一日在日本 Chiba 舉行規模盛大的年會，值得參加。

二、雜交水稻已成為各廠商研發的對象，因其產量高，全世界種植面積廣，亦具高度的商業價值，許多廠商已開發屬於自己的雜交一代水稻品種，反應甚佳。但大多為秈稻品種。建議本省亦應加強粳稻雜交一代品種之研究，以確保商機。

伍、附件。

一、『生物技術在種子與種苗應用之研討會』之內容與行程。

二、出席 APSA 執行委員會年中會議報告資料。

Report to the EC Meeting on the Cooperative Training Courses/Workshop between APSA and TARI

by Chien-Yih Lin
EC member and Director General, Taiwan Agricultural Research Institute (TARI)
(March 15, 2001)

In March of 1999, APSA held its EC meeting at Taiwan Agricultural Research Institute. It was decided in the meeting that cooperative training courses be held at TARI in order to benefit the APSA members for the improved production of quality seeds and seedlings.

After detailed discussion between Dr. Noel Mamicpic of the APSA Headquarters and TARI, an agreement was reached to hold two training courses on cucurbit viruses and embryo/tissue culture in the year of 2000, and one more training course/workshop on seed/seedling technology in a later date to be determined. The two training courses on cucurbit viruses and embryo/tissue culture were held smoothly and successfully in November and December of 2000, respectively.

For the training course/workshop on seed/seedling technology, the Food and Fertilizer Technology Center for the Asian and Pacific Regions (FFTC-ASPAC) was invited as a cosponsor. FFTC, with its headquarters in Taipei, is an international organization for the promotion of agricultural production in the Asian countries. The main reasons of inviting FFTC to cosponsor the project were to seek for more financial support and to strengthen the relationship between APSA and other international agricultural organizations in the region.

Discussion among the three sponsors yielded the conclusion earlier this year to hold a Workshop on Seed and Seedling Science and Technology at TARI, Taiwan in 2001 and a follow-up training course of the same subject at the Philippines in 2002.

TARI was honored to have the opportunity to host the training courses/workshop for serving the APSA members. Representing TARI, I would also like to express my appreciation to the Executive Committee and Dr. Noel Mamicpic of APSA for the very close and pleasant cooperation during the past two years. I sincerely wish that the cooperation between APSA and TARI will be further strengthened in the future.

A brief review/evaluation of the two training courses, as well as an introduction of the upcoming Workshop on Seed and Seedling Science and Technology are listed below.

Training Course on Cucurbit Viruses

The training course was held at TARI from November 1st to December 8th of 2000 (40 days in total). The three trainees were Ms. Kuakoon Bunyanunpappong (ChiaTai Co., Thailand), Ms. Bianca van Haperen (East and West Seed Co., Philippines), and Ms. Yu-Ya Sun (Known-You Seed Co., Taiwan). Senior scientists specialized in viral research from TARI were invited as lecturers and laboratory facilities were also provided by TARI.

The main subjects of the training courses were:

1. Introduction of cucurbit viruses and their characteristics - diagnosis of cucurbit viruses by symptom observation.
2. Identification of cucurbit viruses by serological techniques.
3. Identification of cucurbit viruses by electron and light microscopy.
4. Identification of cucurbit viruses by molecular methods.
5. Large-scaled virus indexing by ELISA techniques.
6. Inoculation of cucurbit viruses and resistance screening techniques.
7. Field survey and sampling techniques.
8. Techniques for preservation of viable viruses and antigens.
9. Techniques for preservation and handling of virus detection kits.
10. Introduction of cucurbit cultivation in Taiwan.

The instructor-in-charge found that the three trainees were well experienced in the routine practices of screening virus disease resistance, hence the contents of the course were modified to a more advanced level and to satisfy the different needs of the individual trainees.

In addition to the arranged courses, Ms. Bianca from the Philippines was allowed to test the resistance of some cucurbit germplasm from her company against several major cucurbit viruses. She had completed at least one experiment on testing the resistance of some Luffa cultivars against ZYMV, WMV-1 and CMV. Ms. Bianca had also generated good discussions with the instructors about how to work on virus detection, sampling, and identifications. The test on some dried cucumber specimens she brought from the Philippines showed that they were not infected at least by ZYMV, the most widely spread cucurbit virus in the would.

For Ms. Kuakoon from Chia Tai company, she was interested in finding out the identities of the viral agents that infected cucumbers in Thailand. The instructors helped her to test, serologically and molecularly, all the possible viral agents on the dried tissues that she brought to TARI. Surprisingly, some of the samples were

infected by geminiviruses based on PCR tests that she had conducted. This information was also new and should be beneficial to TARI scientists well.

Since Ms. Sun is from a Taiwanese company (Known-You), the problems that she and her company had were easier to be understood and solved. She brought specimens that were etiologically confusing to the staff of the company, and spent a great deal of time to identify the possible virus. She had also obtained some interesting and useful results. TARI was so pleased and fortunate to have Ms. Sun in this program. As a native Taiwanese, she had rendered generous help and thus made the other two trainees more comfortable and pleasant during their stay in Taiwan.

The instructors considered that the three trainees were all well experienced, hard working, and enthusiastic scientists. They were excellent in expressing themselves and knew exactly what they and their company really needed. Most importantly, all of them were highly initiative. During the course period, the instructors arranged a free discussion everyday to allow the trainees bring out questions relevant to the training subjects. The outcome of the discussions was so fruitful that the instructors were appreciate of being benefited by the presence of the three distinguished guests.

Training Course on Embryo/Tissue Culture

The training course was held at TARI from December 4th to 15th of 2000 (12 days in total). There were eight trainees from different seed companies. Senior scientists specialized in tissue culture from TARI were invited as lecturers and laboratory facilities were provided by TARI.

The main subjects of the training courses were:

1. Application of tissue culture in agricultural production.
2. Plant propagation through tissue culture.
3. Plant growth regulators and tissue culture.
4. Anther culture and crop breeding.
5. Chromosome doubling techniques.
6. Embryo culture and test-tube fertilization.
7. Gene transfer techniques and genetic engineering
8. Statistical methods for tissue culture experiments.
9. Photographic techniques
10. Field trip.

All the trainees were asked to submit a final report at the end of the training course. The contents of the final reports are summarized below.

Sumitra Kantrong (Chia Tai Co., Thailand)

I have learned many techniques such as anther culture for plant breeding, embryo culture and embryo rescue, mass propagation of many valuable plants, cell suspension culture and protoplast isolation techniques, and gene transformation techniques. What I have learned from the training course and the structure and function of the Tissue Culture Laboratory of TARI is very useful to our research, especially for supporting breeding programs.

Hathaithip Insenee (East West Seed Co., Thailand)

This training course had provided knowledge in anther culture, embryo culture, plant hormone, callus and cell suspension culture, plant gene transfer and genetic engineering, protoplast isolation, and photographic techniques. These subjects, especially anther and embryo culture, are very useful and important for research work in our company. Although the duration of this course is short but some techniques I have learned are very useful and applicable.

Rudy Hermanto (PT. Tahindo Subur Prima, Indonesia)

From this course, I have learned techniques very useful to my job in plant breeding. I have had very impressive experience in the basic science of tissue culture, practices in anther/embryo and protoplast culture, genetic engineering, and photographic techniques. After going back to my company, I will be able to carry on my duty in breeding through tissue culture method. I hope that TARI will be able to provide consultation if I have problems in my job in the future.

Muryanto (East West Seed Company, Indonesia)

I came to TARI with many questions about anther culture although I have been working on it for many years. From this course, I have obtained answers of my questions and I have learned the tricky points of anther culture. I am going to try and apply these techniques to my research work in my company. I hope that Dr. Tsay would help me if I have problems in the future. I also appreciate with the information on biotechnology and statistical method. At TARI, I had my first practice on genetic engineering. Although this techniques is not used in my research now, I am sure it will be of potential importance in the future.

Henry Lai (United Agricultural Co., Taiwan)

In this training course, I have learned a lot of the techniques of anther culture, embryo culture, callus and cell suspension culture, and special photographic techniques. I have many questions concerning with my work and Dr. Tsay always gives me satisfactory answers. I feel that he is a professional and patient scholar. During the period of the training course, TARI has supplied us comfortable dormitory and delicious

meals. It is so nice to know seven friends from the Asian seed companies. It is a very precious opportunity to get together in this training course. I will communicate with them and discuss with them subjects of my work.

R. Pandia Rajan (Namdhari Seeds, Bangalore, India)

I am very grateful to Dr. Tsay for teaching the techniques without hiding any facts and for taking care of us as his children. The boarding and lodging facilities were good. During the course of our training period, his team, especially Dr. Sagare, Mr. Robert, and Ms. Emili have helped us in all the ways.

Wing Man Chin (Clover Seed Co.)

Many thanks to Dr. Tsay who arranged this course and gave us many lectures about the plant tissue culture including anther culture, embryo culture and the test tube fertilization, and also taught us how to take good pictures. The training course not only gave us the conception but also Dr. Tsay's experiences getting for a long time around his scientific area. We also have many lectures about plant hormones, protoplast isolation and culture, plant regeneration, statistical analysis, etc. All of these courses let me know the conception and practical techniques of tissue culture.

Chao Huang

(In addition to many thanks...) I wish to have more time for laboratory exercises.

Instructor-in-charge Dr. H. S. Tsay's comments

The experience of holding this training course was so wonderful as all the participants were very friendly and enthusiastic in learning tissue culture techniques for the purpose of improving plant varieties. The participants were active in discussion sessions and were willing to share their experiences. They were considerable and got along with each other nicely. I have held more than 20 international training courses in tissue culture, I would like to say that the performance of the participants was just superior.

All the participants come from seed companies, or private sectors. I consider it as one of the reasons that they were active, efficient, and eager to learn more during the course of the training. Although the academic and/or practical background in tissue culture was not very uniform among the participants, their attitude to learn and ability to accept were highly admirable. I am confident that what they have learned from the training course will be helpful, more or less, to their research in their individual company. As a researcher and teacher, I am willing to discuss with them any problem in tissue culture that they may have in the future.

The need or interest of the individual participant may be different. If I could know their needs in advance, I would have been able to arrange more lecture and lab exercise of specific subjects for them. Although some participants suggested to lengthen the duration of the course, I still consider that a period up to two weeks should be appropriate for a training in tissue culture.

Possible training courses on virus and embryo/tissue culture in the future

Should there be request of holding similar training courses in the future, TARI suggests that there is possibility of sponsoring a training course on virus in June of 2001, and a training course on embryo/anther culture in the fall of 2002.

Workshop on Seed and Seedling Science and Technology

Jointly sponsored by FFTC, APSA, and TARI, this workshop will be held from June 10 to 16, 2001 at TARI, Taiwan; including a two-day field trip. A follow-up training course of the same subject will also be held at the Philippines and tentatively scheduled in September of 2002. APSA can recommend up to 15 participants to attend the workshop, in addition to the 7 invited by FFTC.

The workshop is concentrated on the application of biotechnology in seed/seedling production. Lecturers of outstanding academic reputation will be invited from different countries, e.g., Japan, the United States, Thailand, Taiwan, etc. The major topics of the workshop are:

A. Using biotechnology on seed/seedling production
   1. Biotechnology on vegetable seed breeding and production.
   2. Hybrid rice F1 seeds production.
   3. Using tissue culture on seedling mass production.

B. Using biotechnology on the identification of crop varieties
   1. Using molecular markers (isozyme, RAPD, SSR, AFLP, etc.) for surveying the purity of seeds and seedlings, further more for the identification within cultivars.

C. Using biotechnology on the breeding of crop varieties resistant to diseases and insect pests
   1. Cloning disease-resistant gene in rice.
   2. Control of ringspot virus in papaya.
   3. Biotechnology on virus-free seed production.

The cost estimation of the participants recommended by APSA is :

1. The participants are required to make their own arrangement for flight between their home countries and Taiwan (round trip).
2. Free transportation between the Chiang Kai-Shek International Airport and TARI, and for field trips, will be provided by the sponsors.
3. The sponsors will bear the expenses on room and board during the prticipants' stay at TARI (4 nights), honorarium for the instructors, and miscellaneous items.
4. The participants are required to pay for their room and board for the two-day field trip, which is estimated to be US$150 per participant.

Workshop on Seed and Seedling Science & Technology

Organized by FFTC-ASPAC in cooperation with the Asian & Pacific Seed Association (APSA) and the Taiwan Agricultural Research Institute (TARI)
10-16 June 2001, Taichung, Taiwan ROC

Rationale

Using high quality seed can be a farmer's biggest bargain. Investment in seed for many crops may represent as little as 5 to 10% of total cost. And often the difference in investment between quality and "cheap" seed will run as little as 2 to 3%. Without a good stand and a vigorous crop, however, a farmer will lose more than what he may save by using seed of inferior quality.

Quality seed must be high in germination, of good vitality, free from insect or mechanical damage, pure for the crop and variety, and contain no inert matter or weed seeds. For optimum growth and production, however, the quality seed or seedlings must be used in conjunction with good cultural practices, correct fertilizer rates, and adequate control of plant pests and diseases.

This workshop aims to address these major aspects of seed and seedling science and technology. By promoting the widespread production and use of quality seeds and seedlings of better varieties, it is anticipated that ordinary farmers on smaller farms may have better access to them. By applying new technology in seedling production and cultural management, this will offer farmers better chances to achieve a more productive and profitable farming system.

Major topics to be addressed

A. Using biotechnology on seed / seedling production
   - Biotechnology on vegetable seed breeding and production
   - Hybrid rice F1 seeds production
   - Using tissue culture on seedling mass production

B. Using biotechnology on the identification of crop varieties
   - Using molecular markers (isozyme, RAPD, SSR, AFLP etc.) for surveying the purity of seeds and seedlings, further more for the identification within cultivars

C. Using biotechnology on the breeding of crop varieties resistant to diseases and insect pests
   - Cloning disease-resistant gene in rice
   - Control of ringspot virus in papaya
   - Biotechnology on virus-free seed production

D. Country Reports

Provisional schedule

June 10 - Arrival of participants
June 11 - Opening ceremony; Lecture and Country Report presentation
June 12 - Lecture and Country Reports
June 13 - Lecture and Country Reports; Final Discussion
June 14 - Field Study Tour
June 15 - Field Study Tour
June 16 - Departure of participants

Participating countries

Japan, Korea, Malaysia, the Philippines, Taiwan ROC, Thailand, Vietnam, and other Asian countries which may be selected by APSA.

Participants' qualifications

Attendance will be by invitation, with 15 participants invited by APSA and seven by FFTC. Aside from the basic criteria of appropriate educational background and experience, it is encouraged that FFTC-invited participants be selected from various sectors i.e. the public sector, the academe or the private sector; and those actively involved or responsible for performing tasks directly related to the workshop. A broader representation would enhance more fruitful sharing of knowledge and experiences among participants during the workshop. The organizers are likewise enjoined to disseminate, whatever new knowledge, information or skills they may have acquired from this workshop, by way of a seminar or workshop upon their return.

All nominations must be received not later than **30 March 2001**.

Invitation letter

On receipt of the name of the participant, the FFTC Director will send the nominee a formal letter of invitation. In order to facilitate communications, the participants should furnish FFTC relevant personal information stating clearly their postal and email addresses, fax and phone numbers. FFTC will correspond directly with the participants once their nominations are received.

Country report

FFTC-invited participants are requested to prepare country reports on any of the major topics to be covered during the workshop. Other topics relevant to the subject matter may be considered upon prior consultation with the workshop organizers. These reports should not exceed ten (10) pages including tables and figures and, together with a summary of not more than one page should reach FFTC and TARI not later than **10 May 2001**.

FFTC-invited participants will be requested to deliver a 20-minute presentation of their country reports and allotted 10 minutes for open forum during the workshop sessions. Details of this will be conveyed to the participants in due time. The participants should notify the organizers ahead of time any audio-visual equipment they may need for the presentation.

Travel arrangements

Participants should ascertain with their travel agents the requirements for a visa to enter Taiwan. To facilitate visa issuance, if needed, a photocopy of the participant's passport should be provided to FFTC. Passports must remain valid for at least six months upon entering Taiwan.

The organizers will provide round trip, economy class air ticket to Taiwan by the most direct route. Depending on the situation, FFTC may either send the ticket by registered mail, forward a Prepaid Ticket Advise (PTA), or request the participant to purchase the ticket, with the airfare to be refunded upon arrival in Taiwan.

Financial arrangements

Their respective sponsors will provide participants specific arrangements for this. As a matter of policy, however, the organizers do not insure participants during travel to and from Taiwan, and will not be responsible for any expenses arising out of sickness, injury, other disability, or loss of life while attending the workshop. Incidental traveling expenses including visa fee, travel tax, airport fees, etc. shall be borne by the participants.

Accommodation and food

Accommodation for participants will be arranged / facilitated by the workshop organizers. It is requested that participants indicate their dietary restrictions, if any.

Further information

Inquiries for further information on arrangements for the workshop should be addressed to:

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