Preface

The International Working Conference on Stored Product Protection (IWCSPP) is held every four years, and it is the premier forum for presentation of research related to safe storage of grain, durable foodstuffs, cereal grains, oilseeds, and quarantine procedures for international transport of these products. The 11th IWCSPP was held in Chiang Mai, Thailand, 23-28 November 2014, under the auspices and control of the Thailand Department of Agriculture, with support from private industry. These Proceedings are the permanent record of the conference.

There were 357 participants from 35 countries and 181 submitted papers with 11 keynote addresses and 119 oral and 62 poster presentations were presented on a variety of research topics relating to stored products at the conference, representing countries from all inhabited continents of the world. The field trips to Bangkok Agro – Industrial Products Ltd, rice mills factory and Thailand Tobacco Monopoly have been organized on the last day of the conference.

The sessions in order from 1-11 were: Emerging Global Issues in Stored Product Protection; Biology, Ecology, and Behavior; Monitoring and Sampling; Engineering for Stored Product Protection; Fumigation, Hermetic Storage, and Modified Atmospheres; Grain Quality and Food Safety; Museum Pests; Residual Insecticides; Integrated Pest Management; Quarantine and Regulatory; and Natural Products/Essential Plant Oils. Each session featured a keynote speaker, in order from 1-11: D.I. Schlipalius, Y. Chanbang, S. Mohan, F. Jian, D. Baributsa, R.J. Hodges, T. Strang, R.N.C. Guedes, C. Athanassiou, S.S. Walse, and A. Insung. Session Heads present at the meeting in order were: G. Daglish and J.E. Throne; J.F. Campbell and N.D.G. White; C. Adler and M.O. Carvalhol; W. Chayaprasert; P. Collins and T.W. Phillips; V. Scussel and D. Baributsa; P. Trematerra; Y. Chanbang and N. Kavallieratos; R. Mahroof and G. Opit; D. Suthisut and P. Fields; and M.J. Pascual-Villalobos and J. Ruidavets. A trade exhibition also attracted a number of international participants and sponsors from private industry, and we thank them for their support.

The Organizing Committee, the Scientific Committee, and the Editors of this Proceedings thank all of the participants who contributed to the success of this conference, including the authors and presenters, the session heads, and the industry participants.

We especially thank the personnel from the Thailand Department of Agriculture who worked so hard on the details of this conference and for their tremendous efforts on our behalf. It is our pleasure to record that the 12th IWCSPP will be held in 2018 in Berlin, Germany. We hope to see many of you at this next meeting!

Sincerely,
Dr. Surmsuk Salakpetch
Chairman of the Organizing Committee
11th International Working Conference on Stored Product Protection

XVII
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Department of Agriculture, Ministry of Agriculture and Cooperatives
Entomology and Zoology Association of Thailand
Thai Phytopathological Society

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Report Address

Your Honorable, Dr. Suwit Chaikiatthiyos, Deputy Director, Department of Agriculture,

First of all, on behalf of the Organizing Committee of the Eleventh International Working Conference on Stored Product Protection, and on my personal behalf, would like to express our sincere gratitude to Your Honorable to preside the Opening Ceremony.

It is a great pride and honor to report to You Honorable about the background of this conference.

The International Working Conference on Stored Product Protection or IWCSPP is an International Organization whose mandate is to prevent losses brought about by the post harvest pests. The IWCSPP is organized every four years wherein the member countries rotate in hosting the conference. During the Tenth Meeting of IWCSPP held in 2010, the meeting had a resolution and it is an honor for Thailand to host the Eleventh IWCSPP this year 2014, to be held during 24-28 November 2014 at The Empress Hotel in this beautiful city of Chiang Mai.

The objective of the conference are to exchange new knowledge, technology and research experiences between lecturers, researchers, students, and private companies, and to build network and cooperation between the academic sector and the private sector for developing the knowledge on postharvest pest management of cereals, grain and for storage and also for export.

The conference will comprise of keynote address from the prominent keynote speakers, and presentations from the distinguished research scientists related to eleven topics with great relevance to stored product protection. A field trip has been organized for the participants to observe and learn from Thailand’s initiatives on stored product protection from the three sites such as the agricultural product processing factories, rice mills, and tobacco processing warehouse.

The IWCSPP is being attended by representatives from 35 countries with a total of 357 participants. The budget used to organized this conference is from the registration fees of participants, sponsors from the private sectors, the Entomology and Zoology Association of Thailand, Thai Phytopathological Society, and also from the budget of the Department of Agriculture.

May I have the honor to invite Your Honorable to deliver the Opening Remarks.

Dr. Nuchanat Na-Ranong
Senior Expert, Department of Agriculture
Opening Remarks

Mr. Chana Pangpiboon, vice governor of Chiang Mai Province,
Dr. Nuchanat Na-Ranong, Senior Expert, Department of Agriculture,
Dr. James Throne, President of Permanent Committee of IWCSPP,
Distinguished Guests, Ladies and Gentlemen

First of all, let me congratulate the organizing committee for being able to convene this very important event, the International Working Conference on Stored Product Protection (IWCSPP), being held here in the beautiful city of Chiang Mai. It therefore gives me great pride and honor to address the opening ceremony of this auspicious occasion.

The topic of this conference is timely and relevant. As preventive methods are the most effective tools to protect stored product. Nevertheless, we need to have an understanding on the conditions and how stored products are infested and through this forum we would be able to learn from the milestones of the recent research and development initiatives.

Reducing the postharvest losses is one of the great challenges in attaining food security at both national and regional level. Moreover, each producing countries has to keep up with the fast pace of trade developments and international standard and regulations. Having said this, product quality must be keep away from the perishables and stored products have to be maintained at minimum possible cost.

Any plant or agricultural product produced for human consumption or animal feed has to be stored in a more or less processed state to be consumed or further processed to a final product. The main factor that distinguishes stored product such as grains, pulses, nuts, dried fruits or dried herbs with the perishable crops such as fruits and vegetables is the water content. Often the protection of perishables is on postharvest protection. Usually, products of a higher water content are attached by fungi and bacteria through infested stems, roots or fruits. Perishables may also lose water and start to sprout as in the case of tuber crops.

Food security also connotes food reserves through the proper storage. The topic for this conference is therefore very relevant and timely. As I looked through the outlined topics for discussion, I am confident that the set objectives will bring us a better understanding about stored product protection.

Research and development on stored product protection is implemented by the Postharvest and Processing Research and Development Office (PHPRDO), and the Plant Protection Research Development office (PPRDO) of Department of Agriculture, Ministry of Agriculture and Cooperatives, Thailand. Relevant research topics include storage insect pests, vertebrates, microbial deterioration such as storage fungi, Aspergillus and Penicillium which are known to produce mycotoxins, integrated stored product protection such as mechanical storage and packaging facilities, hermetic storage and packaging, heat treatments for empty structures.

In line with our priority policies on food safety and on the development of and environmental friendly technologies, our research and development is also directed towards the exploration of biocontrol agents for the control of pests and diseases, such as the use of plant extracts to control pests, and plant extracts to attract pests into traps.
I would like to highlight once more that stored product pests compete with humans when we stock or reserve foods for longer periods. The IWCSPP offers a variety of interesting topics that participants could deliberate on. I would like to encourage the participants to focus discussions and knowledge exchange on important topics such as insect-proof packaging or hermetic storage structures, cool storage or dry storage conditions together with important tool for safe storage. Insect pests control through traps, inspection, temperature surveillance or acoustic methods. Depending on the product and techniques available, physical, biological, biotechnical or chemical means may be used for pest control.

Less hazardous methods of control have gained importance lately. Fumigants and physical control techniques have replaced contact insecticides and low-oxygen controlled atmospheres are substituted for some toxic fumigants. As stored products, climates, storage types and available techniques vary, the most suitable methods need to be identified for each situation.

I would like to stress that the techniques and measures we develop should be low cost and practical for our smallholder farmers. In this way, we could contribute to the betterment of our farmers’ livelihood.

Convening this IWCSPP takes a lot of effort, dedication and commitment. With this I should thank all the people who in one way or another have been a part for the realization of this event. Particularly my appreciation to the Department of Agriculture, Entomology and Zoology Association of Thailand, and Thai Phytopathological Society, to all sponsors for all your kind support. Nevertheless, to all of you, the authors, speakers and resource persons our heartfelt thanks for this gesture of goodwill and cooperation, and looking forward to your active participation in sharing your knowledge and view as your contribution to the success of this conference.

Finally on behalf of the Ministry of Agriculture and Cooperatives and on my personal behalf, would like to welcome you all once again, and my good wishes that your stay will be productive and pleasant. Let this conference be an instrument where we could create a network of experts and friends.

Having this in thoughts, I now declared the International Working Conference on Stored Product Protection (IWCSPP) now opened.

Dr. Suwit Chaikiattiwong
Deputy Director, Department of Agriculture
Welcome Remarks

Dr. Suwit Chaikiattiyos, Deputy Director, Department of Agriculture,

Distinguished Guests, Ladies and Gentlemen

I am, as a representative of the people of Chiang Mai, very pleased and honored to deliver a welcome speech to you all at this International Working Conference on Stored Product Protection or IWCSPP.

Chiang Mai is well known for agricultural production. Major crops in the province are, such as, rice, maize, tobacco and beans. These products obviously need to be well stored for further processing or sale. Problems on stored product pests during storage are inevitably occurred. Therefore, this conference will be very much interesting to stakeholders in this agricultural area, not only those in academic, but to the farmers as well.

I am very proud to welcome all of you, from different countries, and different provinces to this conference.

Chiang Mai is a very beautiful province having many scenic places for tourists, for example, the mountain view of the highest point of Thailand, Doi Inthanon, which the temperature is now very comfortable. The golden stupa of Doi Suthep temple which was built at ancient time having different style from other regions’ temples. I would like to encourage you to visit another interesting place, the Queen Sirikit Botanic Garden which has various kinds of plants. At this place you can enjoy the beauty of tropical trees and flowers. I was informed that there will be study tours to those places mentioned for all of you. Please do not hesitate to join the trip. Also at night time, you can enjoy the lively night life here, in particular, at the night bazaar which having different kinds of goods offered, even the gorgeous local handicrafts.

In addition to those beautiful places I mentioned, I would also like to invite you to try on the northern Thai food which is different from other regions of Thailand. We also have Arabica coffee locally grown, as well as, fruits, such as longan, litchi, and strawberry.

I do hope that you all will be impressed by the beautiful nature, the culture, and the way of life of friendly people here in Chiang Mai. I wish all participants a pleasant stay here and do hope you will come back for your next trip to Thailand.

I sincerely thank you to the Department of Agriculture, the private sector, and other academic institutions involved for choosing Chiang Mai as the place of this important conference and hope that we can hold other future conferences like this.

Once again, Chiang Mai welcome you all here. I wish you pleasant stay during the conference and wish you all safe trip back home.

Mr. Chana Pangpiboon
Vice governor of Chiang Mai Province
Closing Remarks

Distinguished Guests, Ladies and Gentlemen

We come to the close of what has been by all accounts a very successful and productive conference. There have been 181 submitted papers and 357 participants from 35 countries all over the world in this conference. Besides, two workshops on “Phosphine resistance” and “Khapra beetle” were organized by the famous experts to share their experience on the important issues of the stored pests.

On behalf of Department of Agriculture and IWCSPP organizing committee, I would like to thank the speakers, moderators and facilitators. Convening this IWCSPP takes a lot of effort, dedication and commitment. With this I should thank all the people who in one way or another have been a part for the realization of this event. Of course, I would like to thank the participants for your contribution which made this conference a success. During these days, we have shared a common goal and vision on stored product protection along with observe and learn from Thailand’s initiatives on the site visit which I hope this opportunity has given you new insights and I believe that experience and knowledge you have gained from this conference will be reflected and useful for improving your work.

I observed very active participation and lively discussions not only during the formal conference sessions but also among you as participants well after the meetings stopped. I was my pleasure to know that this conference was a forum for cooperation on the solution of the store product protection through your discussion. Your energy and enthusiasm was evident and in saying that I feel free to conclude that this conference was a very great success. And in this conference, you took great strides forward in establishing the kind of networking and exchange of experiences to cooperate on the development of stored product protection which could reduce the losses of agricultural products and affect to strengthen global food security as the conference organizers hoped to achieve

As we are all aware, the IWCSPP 2014 is a jointly organized by Department of Agriculture, the Entomology and Zoology Association of Thailand and Thai Phytopathological Society. Additionally, the IWCSPP 2014 would not have been possible without the huge support from our sponsors which are

1. Mebrom Co., Ltd.
2. Cytec Industries
3. Thailand Tobacco Monopoly

They provide very good support to us. Absolutely, I would like to thank the many sponsors and supporting organizations which are on the list. You can see there are a lot of supports from these organizations.

Again, I am grateful to all staff for their intention, patience and effort on this event and finally, I would like to sincerely thank you all for having taken the time to join us here.

Thank you very much.

Dr. Surmsuk Salukpetch
Chairman of the Organizing Committee