

## **Session Proposal**

CSSJ-JSB-JSTA Special Joint Session in the 7th Asian Crop Science Conference

\* Crop Science Society of Japan, Japanese Society of Breeding, Japanese Society for Tropical Agriculture

### **1. PROPOSED TITLE OF THE SESSION**

Improvement of Crop Performance for Sustainable Agricultural Development in Wetlands

### **2. THE SPECIFIC RESEARCH THEME**

The wetland can be defined as the land that has a predominance of hydric soils and is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions. The expansion of agricultural areas to feed a growing population has led to a major conversion of wetland into farmland in many countries, resulting in disappearance of 50% of the world's wetlands for agriculture and urbanization in the twentieth century. However, there is still a need to increase agricultural production and crop production as well in developing regions of Asia and Africa where the vast area of wetlands is often kept unused for agriculture mainly because of traditional perception of the wetlands as wastelands, badlands, or sources of disease. In the past, the conversion of wetlands to agriculture has been rarely done in a harmonious way with its natural environment and it is now becoming a big issue on how to restore those degraded wetlands. Extensive changes in water environment in wetlands have often led the degradation of physical and chemical properties of soils, microclimatic conditions of ecosystem that is subtly kept in balance and composition of biota. For future development of wetlands to crop production, it is very important to take into account the sustainability issue from the beginning. One way is, instead of making a considerable change in the wetland environments, to incorporate adaptation ability to the wetland into the crop that will be introduced in a particular wetland. Through this approach, agriculture and wetlands can maintain a very harmonious relationship. The waterlogging and submergence on the events for excess water are two major themes in this session. On the other hand, improvements of crop performance under flooding are quite important for sustainable agricultural system under unstable environment at present and in future. This session should be very

timely and can expect to bring valuable inputs from and interaction of scientists involved in this area of research.

### **3. NAME AND ADDRESS OF SESSION ORGANIZER(S)**

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### **4. POLICY RELEVANCE OF SESSION PROPOSAL**

It has been a critical issue in the global political arena to improve the food security in the developing regions of Asia and is still on top of the list for global agenda. The recent promising achievement toward it is development of crop varieties with tolerance to abiotic stresses such as drought, extreme temperature, salt accumulation, excess water and so on. This has been achieved partly by rapid advancement of molecular biology. If some of crop varieties that have been recently developed or will be developed in near future with tolerance to excess water will be incorporated into the lowland environment such as wetlands that spread widely throughout the developing regions, it will make a significant contribution to the food security in the region. For integrated and sustainable utilization of the wetlands, it is very important to consider various crop species rather than focusing on some particular crop group such as rice that has wide adaptability to the wetland conditions. For that, the adaptability of those crops should be further improved for better performance in the wetlands using combined approach of conventional and molecular breeding.

### **5. PRELIMINARY PROPOSED SESSION PROGRAMME**

The program is now under planning. The draft program is as follow:

1. Current status of the wetlands utilization for crop production
2. Adaptation and tolerance of cereal crops in the wetlands
3. Adaptation and tolerance of leguminous crops in the wetlands
4. Improvement of rice performance in the wetland through molecular approach
5. Improvement of rice production through sustainable development of wetland

## 6. General discussion

### 6. PRESENTATION OF PROPOSED SESSION

#### **1. Studies on molecular mechanism of formations of aerenchyma and a barrier to radial oxygen loss in crops under waterlogged conditions.**

Mikio Nakazono<sup>1)\*</sup>, Takaki Yamauchi<sup>1)</sup>, Imene Rajhi<sup>2)</sup>, Hirokazu Takahashi<sup>1)</sup>, Tomomi Abiko<sup>2,3)</sup>, Shunsaku Nishiuchi<sup>1)</sup>, So Yamazaki<sup>2)</sup>, Katsuhiko Shiono<sup>2,4)</sup>, <sup>1)Graduate School of Bioagricultural Sciences, Nagoya Univ., Nagoya, Japan, <sup>2)Graduate School of Agricultural and Life Sciences, Univ. of Tokyo, Tokyo, Japan, <sup>3)Biological resources and post-harvest division, Japan International Research Center for Agricultural Sciences (JIRCAS), Ibaraki, Japan, <sup>4)Department of Bioscience, Fukui Prefectural Univ., Fukui, Japan</sup></sup></sup></sup>

#### **2. Wet Injury of wheat in upland field converted from paddy field in Japan.**

Kentaro Kawaguchi, National Agricultural Research Organisation, Ibaraki, Japan

#### **3. Roles of root system development and function in the growth and yield under waterlogged condition in wheat**

Tomohito Hayashi<sup>1)</sup>, Tomofumi Yoshida<sup>2)</sup>, Kiyoshi Fujii<sup>3)</sup>, Takako Tuji<sup>2)</sup>, Yurie Okada<sup>1)</sup>, Eriko Hayashi<sup>1)</sup> and Akira Yamauchi<sup>1)\*</sup>, <sup>1)Graduate School of Bioagricultural Sciences, Nagoya University, Aichi, Japan, <sup>2)Aichi Prefecture Agricultural Research Center, Aichi, Japan, <sup>3)Aichi Prefecture College of Agriculture Graduates, Aichi, Japan</sup></sup></sup>

#### **4.Secondary aerenchyma formation and root growth response of soybean (*Glycine max*) seedlings under flooded conditions.**

Toshihiro Mochizuki<sup>1)\*</sup>, Satomi Sakazono<sup>2)</sup>, Satoshi Shimamura<sup>3)</sup>, <sup>1)Faculty of Agriculture, Kyushu Univ., Fukuoka Japan, <sup>2)Graduate School of Life Sciences, Tohoku Univ., Miyagi, Japan, <sup>3)National Agricultural Research Center for Tohoku Region, Akita, Japan</sup></sup></sup>

#### **5. Current research status on crop tolerance against swampy condition and crop cultivation in swampy areas of Indonesia.**

Rujito A. Suwignyo<sup>1)\*</sup>, Hiroshi Ehara<sup>2)</sup>, and Ahmad Junaedi<sup>3)</sup>, <sup>1)Department of Agronomy, Faculty of Agriculture Sriwijaya Univ., Palembang, Indonesia. <sup>2)Graduate School of Bioresources, Mie Univ., Mie, Japan. <sup>3)Department of Agronomy and Horticulture, Faculty of Agriculture, Bogor Agricultural Univ., Bogor, Indonesia.</sup></sup></sup>

#### **6. Growth and physiological response of sago palm against aluminum stress under acid condition.**

Ornprapa Anugoolprasert<sup>1)</sup>, Hiroshi Ehara<sup>1)</sup>, Shina Kinoshita<sup>1)</sup>, Hitoshi Naito<sup>2)</sup>, Somchai Chakhatrakan<sup>3)</sup>, <sup>1)Graduate School of Bioresources, Mie Univ., Mie, Japan, <sup>2)College of Life Science, Kurashiki Univ. of Science and The Arts, Okayama, Japan, <sup>3)Department of Agricultural and Technology, Thammasat Univ., Pathumthani, Thailand</sup></sup></sup>

