

## 2.3 Joint Research

### (1) List of Joint Research

Title of Joint Research Project

*\* A representative of joint research to carry out each project*

#### A-1) Micrometeorological Improvement of Agricultural Fields in Arid Lands

Early Detection of Water Stress by Analysis of Chlorophyll Fluorescence Distribution

*Yasuomi IBARAKI\*, Seiji HAYAKAWA and Makio KAMICHIKA*

Study on the Behaviors of NO<sub>3</sub>-N in Sand Dune

*Changyuan TANG\*, Yasuo SAKURA and Makio KAMICHIKA*

The Control of the High Temperature Environment using Latent Heat of Vaporization of the Water-retentive Ceramics

*Haruhiko YAMAMOTO\*, Makio KAMICHIKA and Reiji KIMURA*

#### A-2) Irrigation Management for Water and Salinity Control in Soil

Measurement of Soil Moisture Contents by the Remote Sensing and its Application to Irrigation System

*Soichi NISHIYAMA\* and Tomohisa YANO*

Measurements of Water and Salt Behavior in Soils Using TDR Method

*Jiro CHIKUSHI\* and Tomohisa YANO*

Prediction of Fluctuation in Irrigation Demand in Arid Regions (I)

*Shinichi TAKEUCHI\* and Tomohisa YANO*

#### A-3) Analysis of the Eco-physiological Characteristics of the Root System under Arid Land Condition

Responses and Varietal Differences of Crop Roots in their Cell and Tissue Structures

*Jun ABE\*, Shinobu INANAGA and Yukihiko SUGIMOTO*

Viscoelastic Analysis of Root Cell Walls under Humid and Dry Conditions

*Eiichi TANIMOTO\**, *Shinobu INANAGA* and *Yukihiro SUGIMOTO*

Analysis of Crop Root Formation Using Acoustic Emission ( AE ) Method

*Tomohide SHIMOTASHIRO\** and *Shinobu INANAGA*

#### **A-4) Studies on Water-Saving Cultivation of Crops in Arid Lands**

Effects of Salt on Growth and Bulb Formation in Bulbous Plants

*Hiroshi OKUBO\** and *Masao TOYAMA*

Relation Between Water Saving Rate and Crop Growth

*Yukuo ABE\** and *Masao TOYAMA*

Morphological and Physiological Studies on a Halophyte, *Salicornia*, Expected to be Cultivated on Saline Water Irrigated Fields

*Katsuyoshi SHIMIZU\** and *Kunio HAMAMURA*

#### **A-5) Eco-physiological Studies on Tree Tolerance to Water Deficiency and Salinity**

Fundamental Studies on Technical Improvement of Afforestation

*Katsuhiko YABE\** and *Shigenobu TAMAI*

Comparative Studies on Drought and Waterlogging Tolerances in Salicaceae Species

*Fukuju YAMAMOTO\**, *Norikazu YAMANAKA* and *Shigenobu TAMAI*

#### **A-6) Studies on Farm Land Conservation in Arid Areas**

Effect of Gypsum and Polyacrylamide Application on Erodibility of an Acid Kunigami Mahji Soil

*Taku NISHIMURA\** and *Tahei YAMAMOTO*

The Relationship between Crop Root Zone and Salinization under Water Saving Irrigation Application

*Torahiko TANIGAWA\** and *Tahei YAMAMOTO*

Effect of Organic Matter and Soil Gas on Rill Formation and Erosion

*Kingshuk ROY\* and Tahei YAMAMOTO*

### **B-1) Integrated Researches on Soil-Water-Plant Monitoring by Remote Sensing**

Basic Study on Saline Water Resources Assessment in the Middle East Based on Integrated GIS Database

*Masahiro MURAKAMI\*, Tomohisa YANO and Yoshinobu KITAMURA*

Potential of Estimation of Underground Water Position Using Satellite Data

*Etsuji ISHIGURO\*, Muneharu SATO, Koichi IWASAKI, Yukio TERAOKA, Hiroyuki KIKUKAWA, Sumitaka KASHIWAGI and Makio KAMICHIKA*

Evaluation of Meteorological Environments of the Loess Plateau by Satellite Data

*Nobuhiro MATSUOKA\*, Makio KAMICHIKA and Reiji KIMURA*

Analysis of Spectral Properties of Land Surfaces by Using Remote Sensing Data

*Hisashi FUJIMURA\* and Mitsuhiro INOUE*

### **B-2) Studies on Salt Accumulation and Leaching**

Studies on Evaporation under Advective Conditions Using the Wind Tunnel

*Seiji HAYAKAWA\*, Mitsuo FUKADA, Yasuomi IBARAKI, Makio KAMICHIKA and Tahei YAMAMOTO*

Study on the Measurement of Subsoil Permeability

*Toshihiro MORII\* and Mitsuhiro INOUE*

Mechanism of Simultaneous Transfer of Water, Solute and Heat

*Yasutaka KIHARA\* and Mitsuhiro INOUE*

Reduction of Bare Soil Evaporation under Heterogeneous Conditions

*Tsutomu YAMANAKA\*, Ichiro KAIHATSU and Mitsuhiro INOUE*

**C) Free Subject on Arid Land Studies**

Numerical Study of the Sand Movement in Arid Lands

*Tetsuya KAWAMURA\**, *Hirohumi SATO*, *Makiko KAN*, *Makio KAMICHIKA* and *Reiji KIMURA*

A Study on Photovoltaic (PV) Power System for World Deserts Using the Arid Land Dome

*Tsutomu HAYASHI\**, *Yutaka HARA* and *Makio KAMICHIKA*

Development of Ecotechnology in the Sahel Zone of West Africa

*Toshiyuki WAKATSUKI\**, *Keiichi HAYASHI* and *Tomohisa YANO*

Strategic Study on Assessment of Impacts of Global Warming on the Irrigated Agriculture in Arid Lands

*Tsugihiko WATANABE\** and *Tomohisa YANO*

Measurement of Energy and Mass Transfer from an Agricultural Land Using the Energy Balance Flux Ratio Method

*Hiromichi ODANI\** and *Tomohisa YANO*

Fundamental Studies on the Relationship between Salinization and Evapotranspiration of Agricultural Lands in Arid Area

*Tadao AODA\** and *Tomohisa YANO*

Study on the Use of Water Resources in Sahel Africa

*Yoshihito SHIMADA\**, *Tomohisa YANO* and *Yoshinobu KITAMURA*

The Effect of Cultivar Difference in Water Use Efficiency on Rice Dry Matter Production in Desiccated Soils

*Tohru KOBATA\**, *Sigeto FUJISAKA* and *Shinobu INANAGA*

Investigation for Physiology of Crop in the Arid Area of China

*Tadashi TAKAHASHI\**, *Akihiro ISODA* and *Shinobu INANAGA*

The Relationship between Desaturation of the Fatty Acid and Salt Tolerance in Plants

*Kenichi MUROTA\** and *Shinobu INANAGA*

Fundamental Study on Natural Plant Growth Regulators for Enhancement of Crop Productivity in the Arid Land

*Hiromitsu NAKAJIMA\** and *Yukihiro SUGIMOTO*

Study on Seed Germination Mechanism of Parasitic Weeds

*Koichi YONEYAMA\**, *Yasutomo TAKEUCHI* and *Yukihiro SUGIMOTO*

Studies on Chlorophyll Fluorescent Response and Pigment Structure of Xerophytes under Some Environmental Stresses

*Ken YOSHIKAWA\**, *Shigenobu TAMAI* and *Norikazu YAMANAKA*

Ecophysiological Studies on the Pine Wilt Disease Occurring in Coastal Dune

*Kazuyoshi FUTAI\**, *Fukuju YAMAMOTO*, *Shigenori TAMAI* and *Norikazu YAMANAKA*

A Study on the Production of Local Desertification Map

*Tatsuaki KOBAYASHI\** and *Shigenobu TAMAI*

The Utilization of Water Resources and Agri-rural Sustainable Development in Arid Zone of West Asia and North Africa

*Ryuichi HARA\** and *Tahei YAMAMOTO*

Study about Fertility Conservation of Surface Soil in Arid Area

*Yuichi ISHIKAWA\** and *Tahei YAMAMOTO*

On the Characteristics of Rill Patterns Generated on the Salinity Soil

- On the Effect of the Saline of the Soil on Soil Erosion and Soil Physical Properties -

*Mitsuo FUKADA\**, *Tahei YAMAMOTO* and *Mitsuhiro INOUE*

Preferential Flows and Solutes Transport in Sandy Soils

*Hiroyuki CHO\**, *Tahei YAMAMOTO* and *Mitsuhiro INOUE*

Research on Measurement of the Unsaturated Soil Hydraulic Properties by In-situ Permeability Tests

*Yuji TAKESHITA\** and *Mitsuhiro INOUE*

Effect of Salty Crust on Evaporation from Soil Surfaces

*Haruyuki FUJIMAKI\** and *Mitsuhiro INOUE*

Evaluation of Hydraulic Properties of Unsaturated Soils

*Koji KAMIYA\**, *Takayuki SASOU* and *Mitsuhiro INOUE*

Analysis of Unsaturated Soil Water Movement by Using the Generalized Model for Hydraulic Properties

*Ken'ichirou KOSUGI\** and *Mitsuhiro INOUE*

Scheduling System of Water and Nutrients Application for the High Qualities of Vegetables

*Satoshi YAMADA\**, *Koji INOSAKO* and *Mitsuhiro INOUE*

Comparative study on soil factor affected to biological production in arid land

*Kazuhisa HASEGAWA\** and *Masao TOYAMA*