National Agriculture and Food Research Organization

Kyushu Okinawa Agricultural Research Center,

Miyakonojo Research Station

Towards Active Upland Agriculture and Related Industry in Warm Region

In the upland field of Kyushu-Okinawa region, taking advantage from its warm climate, a variety of land-use type agricultural systems has been developed, and their related processing industries are developing. However, there are various problems such as falling in prices of agricultural product as resulted from the rapid increase of imported agricultural products, a decline in the cultivation area due to the aging of farmers and lack of personnel, adverse effects on the environment caused by inappropriate use of livestock manure and chemical fertilizer, decline in sustainable productivity due to repeated cultivation etc.

At Miyakonojo Research Station of Kyushu Okinawa Agricultural Research Center, our mission is to promote potential researches for sustainable production of warm-field crops and thereby to contribute to the warm-region agriculture and related industries.

Priority research topic

1. Establishment of sustainable technology to develop highly profitable upland farming system in the southern Kyushu
2. Development of superior varieties of sweetpotato and corn

Sweetpotato Breeding Group

In order to contribute to the higher production of sweetpotato and the activation of processing industry, we are conducting research to develop improved varieties.

Variety for starch production (Konamizuki): Its starch has lower pasting temperature property and excellent cold storage stability compared with that of normal varieties, hence becomes a raw material for processing of foods such as Japanese sweets and is beneficial in keeping the texture of processed products soft.

Variety for table use (Beniharuka): It is a good taste variety with smooth surface and good shape. Total sugar contents of its steamed root and baked root are higher than Kokei No.14 (the leading variety for table use in western Japan).

Variety for *shochu* liquor (Koganemasari): It has higher alcohol yield per fresh weight than Koganesengan (the leading variety for *shochu* brewing in Japan) with high storability and suitability for brewing.

Variety for *shochu* liquor (Tamaakane): It contains β-carotene and becomes a raw material for *shochu* with the rich flavor and aroma. It is also suitable for direct planting methods where small storage roots are directly plant in the field.

Corn Research Group

Forage corn, having high yielding and high nutritional potentials, is a key summer crop for self-sufficiency in the forage production. In Kyushu, taking favor from its warm climate over April to November, forage corn can be cultivated thrice per year: spring seeding, late-spring seeding and summer seeding. In order to increase the self-sufficiency in forage production, we are studying high TDN (Total Digestible Nutrient) yield variety for spring seeding and late-spring seeding by evaluating grain yield to improve their nutritional level. Also, to increase the yield and nutritional value for summer seeding, we are working on the development of varieties resistant to southern rust and wallaby ear disease.

Variety for all-seasons seeding (PI2008): Easy-to-use variety that can be available for seeding from spring to summer**.** PI2008 is a medium-late maturing and high yield variety at any seeding time.

Variety for spring and late-spring seeding (Satomidori): Satomidori is a southern rust resistant early maturing variety, hence late-spring seeding is possible in addition to spring seeding.

Variety for late-spring and summer seeding (Natsuhimuka): Natsuhimuka is a late maturing variety with resistance to both southern rust and wallaby ear disease.

Farm Machinery and Crop Management Group

In order to improve the profitability of sweetpotato and processing vegetables, we are developing technologies on reducing loads of farm works and cultivation system. In case of sweetpotato, to shorten the working hours, we are developing technologies on direct planting and plug seedling cultivation. In case of processing spinach, we are developing cultivation technology to stabilize the growth in winter season and thereby to achieve stable supply according to a given production plan. As a part of technology development, we are conducting research collaboration with public institutions etc. and demonstration tests in the actual farmer's fields.

Crop Physiology and Genetics Group

We are conducting fundamental research aiming to develop key technologies involved in efficient breeding of new sweetpotato cultivars and utilization of the developed cultivars. Our current research projects include: (i) development of simple and easy selection techniques for pest and disease resistant sweetpotato, (ii) development of techniques to control major diseases of sweetpotato, (iii) characterization and genetic alteration of useful components in sweetpotato, (iv) elucidation of genetic factors related to dry-matter production of sweetpotato.

Soil Management Group

Our aim is to develop the sustainable agricultural production through using accessible irrigation and bio-based fertilizers while reducing agricultural chemicals and fossil-based fertilizers.

In Southern Kyushu, as the agricultural system is changing from crop production to field and facility vegetable production, the demands for irrigation are becoming diverse. We destined to develop such a tool which can assist the formation of social agreement on water usage by GIS (Geographical Information System). In addition, taking advantage of the circumstances like Southern Kyushu where animal manure is easy to obtain, we would like to develop the new technology on making a manure compost followed by rational use of it.

History

1960 Establishment of Upland Field Experiment Station, Ministry of Forestry and Agriculture
1988 Reorganized into Upland Field Use Station
1998 Relocation of Genetic Resource Utilization Laboratory to Miyakonojo
2001 Ministry of Agriculture and Forestry transferred to Incorporated Administrative Agency, National Agricultural Research Organization, Kyushu Okinawa Agricultural Research Center
2006 Renamed to National Agriculture and Food Research Organization, Kyushu Okinawa Agricultural Research Center
2015 Transferred to National Research and Development Agency, Kyushu Okinawa Agricultural Research Center

Number of staffs as of April 1, 2016

38 Peoples（General Job 5 peoples, Technical Job 14 peoples, Research Job 19 peoples）

State

545,003 m^2（Internal construction state 66,082 m^2, Field 251,954 m^2, Others 226,967 m^2）

Location, geography, soil and weather

It is located nearby to Mochio Park in the western part of Miyakonojo city, Miyazaki prefecture, Japan. The site occupies a corner of tongue-shaped plateau with 180 m altitude as opened towards east. The soil is an Andosol (volcanic ash soil) with a multisequum profile, reflecting repeated tephra deposition and subsequent soil formation. The upper layers are rich in humus, below that a thick bora (pumice) layer exists, allowing high water retention and drainage. The annual average temperature is 16.5 °C, the maximum temperature in the summer exceeds 30 °C in many days, but there are high variations among those days. The annual rainfall is 2, 881mm, and from autumn to winter it is light rain with lots of sunny days. First frost occurs in early-November and the last in late-March.

Organization

Division of Upland Farming Research (Director, Sweetpotato Breeding Group, Corn Research Group, Farm Machinery and Cultivation Group, Crop Physiology and Genetics Group, Soil Management Group), Communicator, Miyakonojo Administration Team, Technical Support Center Operations Unit 3.

Transportation and Address

From Miyazaki Airport take express bus (bound for Miyakonojo) to JR Miyakonojo station Take JR Kyushu (Nippo Line) and get off at JR Miyakonojo station. Take the Takasaki Kankou bus (bound to Kirishima Shrine) and get off at Yokoichi bus stop. Walk 20 minutes. 6651-2 Yokoichi, Miyakonojo, Miyazaki 885-0091 Japan. TEL:+81-986-24-4270, FAX: +81-986-24-4283.

Home page

http://www.naro.affrc.go.jp/karc/introduction/chart/hatasaku_area/index.html