

# Systemization and Horizontal Expansion of Organic Agriculture Techniques

- Organic agriculture has seen the **accumulation of outstanding techniques that have been cultivated out in the fields**. It is necessary to **systemize these techniques, expand them horizontally, and promote social implementation of techniques currently being developed**.
- In order to horizontally expand the various production techniques, **cultivation technique manuals and other materials are created and widely provided to extension and training organizations across Japan**. Additionally, **creating networks of relevant parties to share techniques and promote research and development for the sustainable improvement of production techniques**.

## [Examples of organic farming techniques developed in fields]

### Soil solarization of soil (upland field crop)



Farmland is covered with transparent sheets and solar heat is used to eliminate weed seeds in the soil.

### Seedling raising techniques (paddy rice)



- Potted seedlings suitable for mechanization are raised
- Medium-sized seedlings or larger are used to ensure good rooting

### Weeding techniques (paddy rice)



NARO worked with Minoru Industrial Co., Ltd., prefectures, and producers to develop a rideable weeder in 2015

Photos: NPO Private Rice Research Institute

## Compilation of various techniques to date (manuals, etc.)

- Organic agriculture cultivation manual  
(-Case studies and research results from fields)



Introduces stable cultivation techniques based on research results on double cropping of paddy fields in warm regions, greenhouse cultivation of spinach, and outdoor cultivation of lettuce in cool, highland regions.

\*Can be downloaded from the NARO website



- Organic rice cultivation techniques manual, focusing on mechanical weeding techniques ver. 2020



Provides easy-to-understand explanations of organic rice cultivation management techniques, including weed control systems. Also includes an overview of field demonstration tests and production costs.

\*Can be viewed from the NARO website



- Organic JAS-compliant open-field cultivation of cruciferous vegetables using solar soil disinfection and net tunnels (2016)



Researches cultivation methods that use solar disinfection and net tunnels so that anyone can produce cruciferous vegetables while adhering to the Organic JAS standards.

\*Can be downloaded from the NARO website



- Research on organic rice cultivation in cold regions (2016)



Introduces the economics of organic rice cultivation, individual techniques for weed control, disease and pest control, and fertilizer management that are suited to the weather and soil conditions of cold regions, as well as a technical system that combines several individual techniques.

\*Can be downloaded from the NARO website



- Standard operating procedures for soybean organic cultivation technique systems in the Kanto region (2024)



Explanations with concrete data on the effectiveness of selecting varieties suitable for organic soybean cultivation, changing sowing times to ensure yields and avoid insect damage, and controlling weeds through intertillage soiling.

\*Can be downloaded from the NARO website



# Development of Organic Farming Techniques

- To realize the MIDORI Strategy for Sustainable Food Systems that aims to both strengthen food security and improve agricultural productivity with sustainability, it is important to develop new techniques to reduce the use of chemical pesticides and fertilizers and to widely promote organic agriculture.
- To this end, the National Agriculture and Food Research Organization (NARO) collaborates with other institutions to conduct research projects to promote organic agriculture.

## Development of pest control techniques for organic cultivation of horticultural crops

### <Research overview>

In order to promote the shift to organic farming in horticultural crops, verification of soil disease suppression effect by soil solar heat curing treatment\* and development of domestic natural predator preparations, etc.

Verifying the effectiveness of soil solar heat curing treatments



\*Solar soil curing treatment: Technique that uses the heat of the sun and the heat of microbial fermentation to heat the soil to eliminate weed seeds and pathogens.

Development of domestic natural predator preparations



Phytoseiidae that prey on spider mites

Project name: Promotion of agriculture, forestry, and fisheries research as part of technology development and demonstration projects for realizing the MIDORI Strategy for Sustainable Food Systems (research adapts to on-site needs)

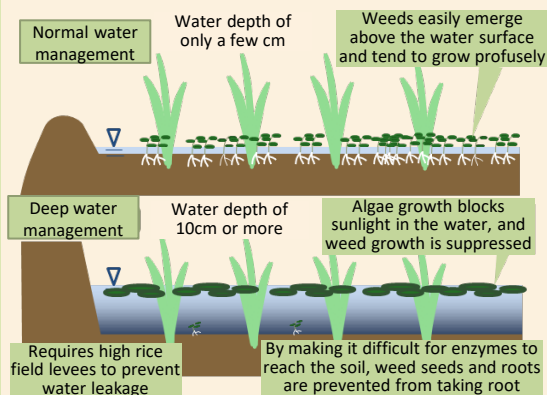
Research period: FY2023 to FY2025

Research institutions: NARO (representative); Japan Biofarm Co., Ltd; Ishihara Sangyo Kaisha, LTD.; Nippon Soda Co., Ltd.; Kyoto Biken Laboratories, Inc.; and Kagoshima Pref., etc.

## Development of labor-saving weed suppression technology by using deep water management to promote organic farming

### <Research overview>

Developing techniques for maintenance of rice field levees and efficient mechanical weeding techniques, which are necessary for deep water management that is effective at suppressing weeds in organic rice cultivation



(Image of deep water management)

Project name: Promotion of agriculture, forestry, and fisheries research as part of technology development and demonstration projects for realizing the MIDORI Strategy for Sustainable Food Systems (research adapts to on-site needs)

Research period: FY2022 to FY2024

Research institutions: NARO (representative); Akita Pref.; Shimane Pref.; Miyagi University; Akita Prefectural University; OPTiM Corporation; and SANYO KIKI CO.,LTD.) etc.;

## Demonstration of labor-saving weed control and stable production in rice paddy organic cultivation system and development of support application

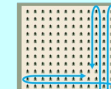
### <Research overview>

Demonstration of the effect of reducing weeding time by using a double-row planting rice planter that enables mechanical weeding in both vertical and horizontal directions, and development of an application that supports fertilization management

### Technological elements that contribute to labor-saving weeding and stable production



Double-row rice planting machine



Vertical/horizontal orthogonal mechanical weeding

Development and introduction of application for automatically calculating organic material blends

Introduce technology

Demonstration tests aimed at establishing an efficient organic cultivation system for the Tohoku and Kyushu regions

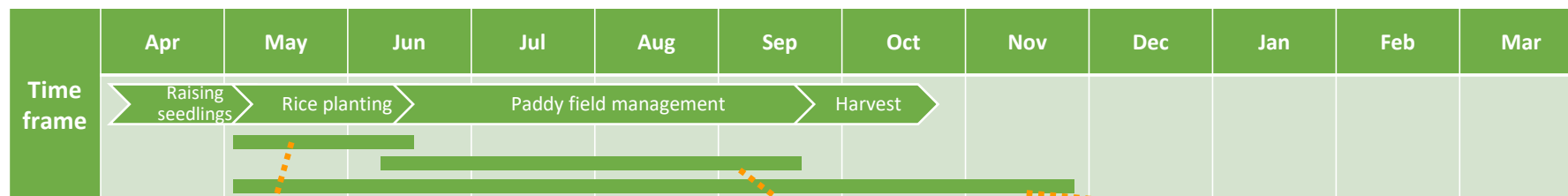
Project name: Development and improvement of strategic smart agricultural technologies, etc.  
Research period: FY2022 to FY2024  
Research institutions: NARO (TARC (representative), IAM, KARC, NIPP); Saga Pref. Test Field

# Creation of Regionally Appropriate Organic Farming Manuals

- In order to shift to a "green cultivation system" that combines "environmentally friendly cultivation techniques" and "labor-saving techniques that utilize cutting-edge technology, etc.," MAFF is supporting the shift to a green cultivation system by helping to create cultivation manuals tailored to each production area, etc.

## [Case study] Technical demonstration of organic cultivation in paddy fields

- The Osaki City Organic Agriculture and Greening Promotion Council (members: Osaki City, Miyagi Pref., Shin Miyagi Japan Agricultural Cooperative, Osaki Agricultural Development and Extension Center, farmers, and agricultural machinery manufacturers) has been conducting cultivation demonstrations since fiscal year 2022, with the aim of establishing an organic rice cultivation system that introduces weeding robots, water management systems, and robotic grass cutters.
- Based on the results of the demonstration, they plan to create a cultivation manual for the production area during FY2023.



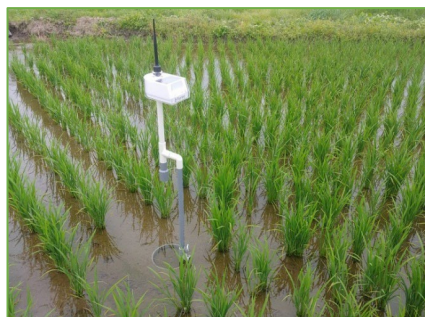
### AIGAMO Robot

Automatically navigates by using GPS, stirs up mud that inhibits photosynthesis, and reduces the number of times herbicides are sprayed



### Water Management System

Let farmers check water levels and other data on their smartphone. Water volume can be remotely adjusted. Reduces patrol frequency and time.



### Robot Lawn Mower

Robotic lawnmower that can be operated via a remote control reduces the labor required for weeding along rice field levees. Sharing reduces the cost of the robot.

