

# Miyagi Prefectural Forestry Research Institute

## OUTLINE

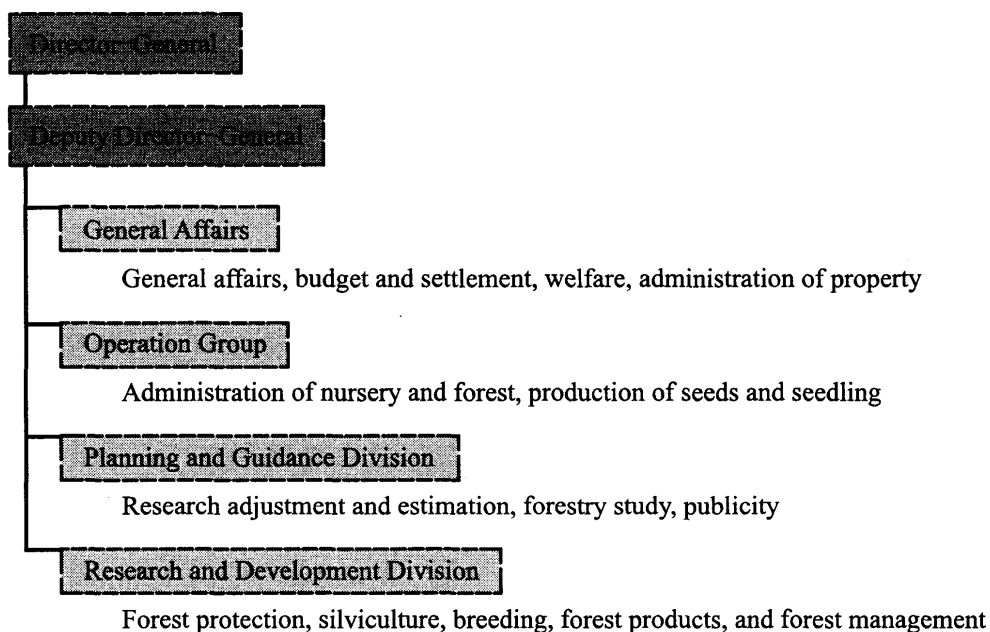
### The role of Miyagi prefectural Forestry Research Institute (JAMFRI), Japan

Through research and technological development for forests and forestry, JAMFRI contributes to improvement of life and industry in Miyagi prefecture, following 3 key principles : " Increase ", " breeding ", and " good use ".

#### History

- 【1953】 Established as Miyagi Prefectural Agricultural Experiment Station, Forestry Department
- 【1962】 Established as Miyagi Prefectural Forest Tree Breeding Station
- 【1970】 Established as Miyagi Prefectural Forestry Research Institute (Unification of Agricultural Experiment Station Forestry Department and Forest Tree Breeding Station )

### Organization and Contents



### Outline of research and development

#### -For enhancing multi-functionality of forests-

- ◆Breeding of cryptomeria (sugi), and hinoki cypress and other species, which improves growth increment, and tolerance to cold damage, and so on.
- ◆Selection of varieties resistant to pine wilt disease (Japanese red pine, Japanese black pine).
- ◆Development of the control method for Rooshi pitch canker, which deteriorates quality of hinoki cypress wood.
- ◆Investigation at 20 survey points for effects of acid rain on forests.
- ◆Research for the control method of countryside forests.

#### -For receiving favors from forest resources-

- ◆Development of highly functional domestic timber for wooden houses.
- ◆Development of new materials, utilizing wood injured by pine wilt disease, bark and other unused resources.

- ◆Development of the artificial cultivation method for the wild mushroom as natural, healthy food.
- ◆Development of mechanized operating system, especially the improvement of productivity of high performance forestry machines.

**-To foster forest employees and forest supporters-**

- ◆Training for forestry masters and high performance forestry machine operators. They the future leaders of regional forestry.
- ◆Forestry school revegetation course, open to the public in order to deepen understanding of forests and forestry among the people of Miyagi.

**Recent results of research and development in JAMFRI**

- ◆A supply of fine seeds and seedlings for forest owners.
- ◆Patent of fire-retardant material, cryptomeria(sugi) LVL ( Laminated Veneer Lumber ).
- ◆Selection and development of the field culture method for *Lyophyllum decastes*.
- ◆Development of a retaining wall for civil engineering utilizing thinning.  
(Applying for a patent.)

**Forestry Research Institute premises**

Main establishment

- Land area ( 102.77ha )
- Main building and house 4,990m<sup>2</sup>
- Location
  - 25km north from center of Sendai City.
  - 3km from Taiwa-matsushima Interchange of Tohoku Expressway.

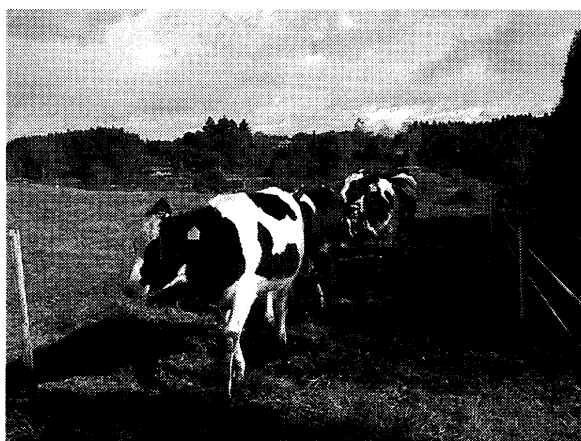
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## Introduction of Miyagi Prefectural Livestock Experimental Station, Japan

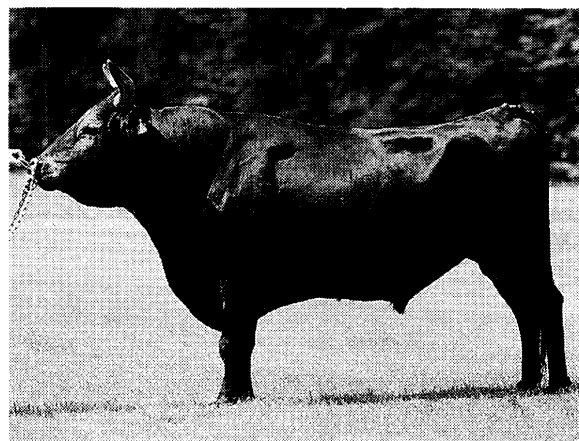
The Miyagi Prefectural Livestock Experimental Station (MLES) is a research organization established in 1975, with the amalgamation of Miyagi Prefectural Aquaculture Experimental Station Livestock Department and Miyagi Breeding Farm. The MLES aim at playing an important part in increasing the productivity of safe and high quality animal products in Miyagi. To achieve the aim, we have been pioneered innovative techniques and bred high quality animals based on the new scientific knowledge, and disseminated them to farmers in order to contribute the further flourish of the future

livestock industry in Miyagi.

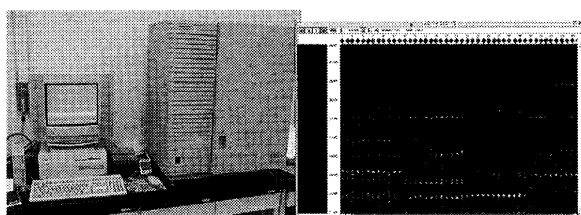
The MLES has fifty full-time staffs including twenty-two researchers. Research works are carried out at three sections ; research for cattle (Dairy & Beef), swine, and forage crop and livestock industry environment. These sections research on technical improvement in the livestock production including cloning and genetic breeding, the use and the selection of forage crops that are suitable for the climate of Miyagi Prefecture, and the process and the utilization of animal wastes. We are also breeding and provided animals and semen to farmers.



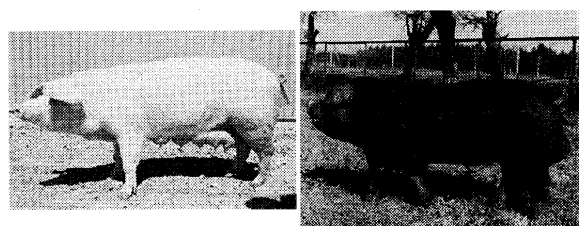
Nutrient requirement of heifer on preparturient stage. Control preparturient disease (Bovine mastitis).



The test of meat production performance in Japanese Black Cattle. Studies on the fattening technology for the quality beef.

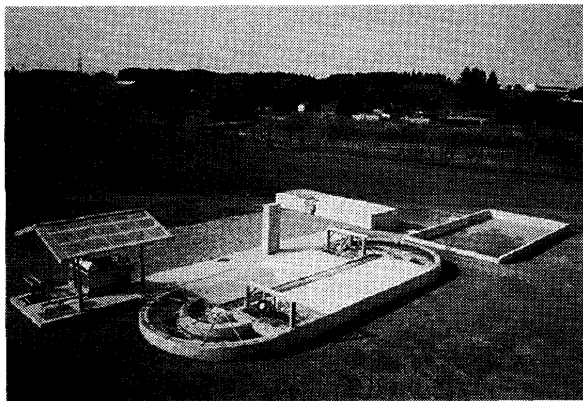


Breeding and genetic improvement of animals using molecular genetic analysis. Detection of hereditary diseases (Swine, Bovine)



"Miyagino"  
The line breed landrace pig.  
High Dairy gain.  
Thick Loin-eye area muscle.

"Shimofuri-Red",  
The line breed Duroc pigs.  
High Dairy gain.  
Intramuscular fat and tender meat.  
Thick Loin-eye area muscle.



Actual proof of activated sludge batch treatment system for livestock wastewater.  
Test of low cost compost manufacturing method manufacturing.



Studies on rice whole crops silage.  
The selection test of the forage crops suitable climate of Miyagi.

## Introduction of Miyagi Prefectural Furukawa Agricultural Experiment Station, Japan

### **Brief History**

Furukawa Branch Station of Miyagi Prefectural Agricultural Experiment Station was established in 1921 with its objectives to conduct research programs and develop new technologies related to rice cultivation improvement in northern part of the Sendai Plain, the main rice growing district of Miyagi Prefecture. The station also has the responsibility according to the national breeding program to develop new rice varieties with good quality adaptable to the middle and southern part of the Tohoku district (northeastern district of Japan), since 1926. In 1973, the branch station was up-graded and named Miyagi Prefectural Furukawa Agricultural Experiment Station with widening responsibility on the research programs for the rice production in Miyagi Prefecture. In 1999, the station was newly settled at the current place.



### **Location**

Miyagi Prefectural Furukawa Agricultural Experiment Station is in Furukawa city 41 km north from Sendai or approximately 400 km northeast from Tokyo. It is located on 38° 36'N latitude and 140° 55'E longitude and is about 28.0 m above sea level.

### **Climate**

Mean annual temperature : 11.1 °C, Mean annual rainfall : 1,200 mm, Total annual sunshine : 1,500 hr.

### **Soil**

The land area of the station consists mostly of alluvial soil classified as "Saga series(code number1303)".

### **Organization**

#### **1. Director General**

**2. Dep. of Administration affairs :** General Affairs, Accounting

#### **3. Dep. of Breeding**

**research area :** Rice Breeding

We are developing rice varieties as the commission research of Ministry of Agriculture, Forestry and Fisheries of Japan. Rice varieties bred in Furukawa Agricultural Experiment Station stretch to 36 percent of cultivars in Tohoku district at the year of 2001. Rice variety Hitomebore, which was born and bred in this institute and has both of cold tolerance and good eating quality, has been embraced by 22 prefectures in Japan from Tohoku district to Okinawa prefecture, the southernmost part of Japan.

In 2002, the planted area of Hitomebore has occupied the second place in Japan, and it has really become one of the big-name rice cultivars in Japan.

Besides, we also breed rice varieties with new characters to be used for various purposes, for instance, scented or colored rice varieties and low amylose varieties.

The green house for accelerated generation advancement, which allows us to cultivate four times in one cropping season, provides us shortened breeding cycle, as is the case with the anther culture breeding system. With the help of DNA marker method, we are eager to develop the efficient selecting technologies for rice varieties equipped with cold tolerance and blast disease resistance.

Some of the main research tasks are as described below;

- Enhancement of cold tolerance
- Enhancement of rice blast disease resistance
- Breeding of rice varieties with high quality and superior eating quality

#### **4. Dep. of Lowland Farming**

**research area :** Agronomy (Rice, Soybean, Wheat, Barley), Weed Control

The principal purpose of the division is to establish systemized farming technologies with low cost and high quality crop production of rice, barley, wheat and soybean in paddy fields.

The key objective of our research activities is four-fold : first, performance test for recommendable crop varieties, for instance rice varieties equipped with cold tolerance and good eating quality, second, establishment of cultivation technologies for newly developed varieties, third, development of low cost and labor saving rice direct seeding technologies, and fourth, technologies of paddy-upland rotation for high utilization of paddy fields.

At the same time, we implement the regular survey on the growth of rice, barley, wheat and soybean, including nitrogen nutrition diagnosis of rice plants in several districts. Based on these survey data and diagnosis results, we offer timely and accurate information to farmers and extension agents as periodic pamphlets.

Some of the main research tasks are as described below;

- Development of direct seeding technologies aimed for high quality and good taste rice production
- Weed control experiments in both of the upland and flooded conditions
- Establishment of wheat-soybean inter-cropping technology aiming for highly and stable productivity of these crops in paddy-upland rotation system

### **5. Dep. of Soil and Fertilizer**

**research area :** Soil Management and Plant Nutrition

We are engaged in investigations on plant nutrition, soil conservation, soil pollution prevention and farmland consolidation to improve crop production in paddy fields. Main facilities we have are soil precise analysis room, crop plant nutrition laboratory, water quality laboratory and atomic absorbance analysis room, and these facilities allow us to research crop plant nutrition and environment conservation.

We carry out the analysis of plant and soil nutrients such as nitrogen, phosphate, potassium, magnesium. Additionally, we implement the analysis of methane gas concentration emitted from paddy fields using gas chromatography. We are also engaged in development of information network system for crop cultivation by exploitation of remote sensing techniques

We implement analysis of ingredient fertilizers and

feeds as the inspection station of Miyagi prefecture. An open laboratory is prepared for farmers to do their analysis of soils, rice quality checking and other research activities by themselves.

Some of the main research tasks are as described below;

Development of remote sensing technologies towards establishment of easy and wide measurement methods for soil and plant properties and growth diagnosis of rice plants

- Development of technologies for farmland consolidation in consideration of the multiple functions of paddy fields, such as prevention of flood and soil erosion, preservation of rural landscape and recreational amenities

### **6. Dep. of Crop Protection**

**research area :** Disease Control and Pest Control

The research objectives of the division are to develop protection technologies for crop plants, mainly rice, wheat, barley, and soybean, against insect pests and diseases. The stages and periods of occurrence of insect pests and diseases vary according to various conditions, therefore we research the effect of weather conditions, cultivation conditions and cultivation circumstances on their occurrences.

Based on the results, we improve predictive accuracy for the occurrence of pests and diseases. And the results will give us the grounds for development of technologies towards "Integrated Pest Management (IPM)" with exploitation of field husbandry technologies such as water management, fertilization management, selection of cultivars, utilization of natural enemies and other non-chemical pest control methods. The IPM is expected to control the degree of occurrence of causal microbes and insect pests below the economic acceptable level, and it will provide advances in pest control methods alternative to "Exhaustive Pest Eradication Method".. Some of the main research tasks are as described below

- Researches on the role of native natural enemies such as spiders, tree frogs in paddy fields
- Investigation of effective blast disease control method by cutting off the source of infection by use of DNA finger print method

Compiled by Yoshikazu Takeda