

## The concept and role of the “knowledgeable farmer” As the core manpower in knowledge-based agriculture

**T**HE OBJECTIVES of this study were to define the concept and role of knowledgeable farmers as the core manpower in knowledge-based agriculture. Through a review of the literature and verification by a panel of experts, this study identified the following features:

- The concept and traits of knowledge-based society;
- The need for, and significance of, knowledge-based agriculture;
- The concept and characteristics of knowledge-

based agriculture;

- The concept and traits of knowledgeable farmers as the manpower for knowledge-based agriculture; and,
- The role played by knowledge (experience and information) in this type of farming.

News source: **Rural Development Administration (RDA), Suwon, Korea**

For further information, *Korean Journal of Sericultural Science* 32, 1: 53-68

## Training and support for “knowledgeable farmers”

**T**HE PURPOSE of this study was to identify a suitable education and training strategy to develop “knowledgeable farmers”, and a support system to serve them. For this purpose, we reviewed the literature and carried out interviews with “knowledgeable farmers” identified by the Ministry of Agriculture and Forestry of Korea. The interviews were designed according to the advice of a panel of experts.

As a result, we identified seven important areas for education and training. These were an appreciation of agriculture, problem-solving abilities,

social skills, leadership, agricultural management, and information processing ability. It was suggested that any education and training strategy should include educational goals, educational objectives, teaching methods and methods of evaluation, to develop “knowledgeable farmers”, based on the analysis of needs expressed by knowledgeable farmers.

News source: **Rural Development Administration (RDA), Suwon, Korea**

For further information, *Korean Journal of Sericultural Science* 32, 3: 1-20

## Genetic engineering of drought resistant potato plants by introducing the trehalose-6-phosphate synthase (TPSI) gene from *Saccharomyces cerevisiae*

**I**N YEAST, trehalose-6-phosphate synthase is a key enzyme for trehalose biosynthesis, encoded by the structural gene TPSI. Trehalose affects sugar metabolism as well as osmoprotection against several environmental stresses, such as heat and desiccation. The TPSI gene of *Saccharomyces cerevisiae* was engineered under the control of the CaMV 35S promoter for constitutive expression in transgenic potato plants by Ti-plasmid of *Agrobacterium*-mediated transformation. The resulting TPSI

transgenic potato plants exhibited various morphological phenotypes in culture tubes, ranging from normal to severely retarded growth, including dwarfish growth, yellowish lancet-shaped leaves and aberrant root development.

News source: **Rural Development Administration (RDA), Suwon, Korea**

For further information, *Molecules and Cells*, 10, 3: 263-268,

# Production technique of a piglet from the blastocyst produced by a modified *in vitro* system

**A** **MATURE** ovum or fertilized ovum is usually used in the production of transformants and clones.

However, because these are collected from the organism, this procedure has a high labor cost. Although examples of success have been reported, the efficiency is low.

Before the embryo is transferred to the sow, its viability and developmental potency, or the success or failure of gene introduction into the embryo, must be evaluated.

External cultivation of pig embryos not yet complete. There are no viable offspring, even if the blastocyst is transplanted after cultivating it for 6 days. However, piglets are born when eggs which have matured and been fertilized *in vitro* are cultivated extracorporeally at the 2 day, 2–4 cell stage, after which embryo transfer is carried out.

The new technique produces live piglets from blastocysts produced by a modified *in vitro* system. The method of external cultivation for the extracorporeal production of embryos was improved, and a new technique which produces piglets by the transplantation of blastocysts was established. In this way, the production of clones and transformants using ova *in vitro* has been made more efficient.

News source: **National Institute of Agrobiological Sciences, Japan**

For future information, see K. Kikuchi, Onishi, N. Kashiwazaki, M., Iwamoto, J., Nogushi, H. Kaneko, T. Akita and T. Nagai, 2002. Successful piglet production after transfer of blastocysts produced by a modified *in vitro* system. *Biol. Reprod* 66: 177-185.

## New silkworm variety “Sericin Hope” which produces silk glue

**T**HE **NEW** silkworm variety “Sericin Hope” has been developed which secretes the protein sericin. This is more productive than other sericin-producing silkworm varieties.

There are two kinds of sericin silkworms. One is the naked pupa Nd strain, which secretes silk thread at a rate of 30 mg/head, with spinning and cocooning rates of 99%. The other sericin silkworm, the Nd-s strain, which secretes only a few silk threads, with a sericin content as low as 92%, at the cocoon stage. Hence, neither of the existing strains are practical for sericin extraction.

Therefore, it was necessary to develop a silkworm variety which produces sericin protein efficiently. It

secretes silk thread, at the rate of about 80 mg/head, while the spinning and cocooning rates have been improved to 99%. The output of the cocoon layer is over four times that of the Nd strain. Sericin can be very efficiently produced, because the sericin purity is as high as 98.5% at the cocoon stage.

The sericin protein appears to be a functional material with antioxidative properties. It is expected to be of medical use in skin care and other fields.

News source: **National Institute of Agrobiological Sciences, Japan**

For further information, E-mail: [www@nias.affrc.go.jp](mailto:www@nias.affrc.go.jp)