SUBSURFACE WATER LEVEL CONTROL SYSTEM “FOEAS” AND ITS DIFFUSION

Tatsumi Tomosho and Noburo Haraguchi
National Agricultural Food Research Organization (NARO), Japan

Background: Paddy Field Diversification

Rice production controls have been implemented in Japan since 1970, but Japan’s food self-sufficiency has continued to be low. Overall food self-sufficiency ratio in 2017: 38%

- Rice: 97%
- Wheat: 14%
- Soybeans: 28%
- Vegetables: 75%

The use of paddy fields to produce upland crops (wheat and soybeans) is desirable.

Outline of the FOEAS

The FOEAS equipped for both subsurface irrigation and subsurface drainage

- Paddy-field-specific subsurface drainage technology: combination underdrain
  - Crossing main underdrain with sub underdrain: improved areal drainability

FOEAS Features: High Drainage Capability

Contents

- Background: Paddy field diversification
- Outline of FOEAS
- FOEAS features
- Effect of FOEAS on soybean yield
- Diffusion of FOEAS
Germination and seedling emergence of soybean are very sensitive to soil moisture conditions—the soil cannot be too dry.

FOEAS users can set subsurface water level higher than usual (e.g., –10 cm) to promote germination of soybean.

Topsoil moistened at higher subsurface water level

The subsurface water level with FOEAS was maintained almost constant (~35 cm).
→ Soil moisture content in the topsoil was maintained almost constant.
The level without FOEAS varied widely from –80 cm to the soil surface.
→ Soil moisture conditions varied widely, from very dry to very wet.

The effect of FOEAS on yield in poorly drained soil is evident.
In some cases, the effect is not evident, probably owing to weather differences.

Future Prospects: Diffusion of FOEAS in 2017

Future Prospect: Use of FOEAS in vegetable production
Thank you

FOEAS user's manual (in Japanese) can be downloaded on the NARO website.