

# Sustainable and resilient social system for healthy nature

**R&D Project Title :** Innovative crop production with adjustment of flower opening time in the era of global warming

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## Summary :

Rice plants are most susceptible to environmental stresses at flowering, resulting in high frequency of sterile spikelets. It is of great challenge how we can create sustainable and resilient rice production system reducing risk of damage on rice in the era of global warming.

The early-morning flowering (EMF) trait is hypothesized to reduce the damage on spikelet sterility under combined stresses of heat and drought since both water and temperature factors are more favorable to rice plants in the early morning.

This study demonstrates EMF traits is effective in enhancing the rice production under heat and drought stresses. Discovery of an elite gene that enable adjustment of flower opening time would contribute to the innovative crop production to ensure global food security.

Legends for right images. 1 Rice plants growing in the experimental field without irrigation, 2 A rice panicle with sterile spikelets caused by high temperature stress at flowering, 3 Early-morning flowering rice that already flowered at 8:30 am, 1.5 hours earlier than the flowering in the cultivar.

