Water Quantity Enhancement Activity – WQT13 – Intermittent flooding of rice fields

Enhancement Description

This enhancement consists of managing irrigation water on rice fields by allowing them to "dry down" between full flood conditions to a saturated soil condition prior to re-flooding the field.

Land Use Applicability

Cropland

Benefits

This enhancement decreases the quantity of irrigation water used during the growing season. Additional benefits may include reduction in greenhouse gas production, reduction in arsenic levels in rice and/or energy conservation.

Conditions Where Enhancement Applies

This enhancement applies to crop land use acres with leveed fields currently utilizing flood irrigation on rice without consideration of soil moisture content and plant water needs.

Criteria

1. Install, permanently, a flow meter on the well or re-lift pump supplying the irrigation system.
2. Deliver water to individual rice paddies through a "multi-inlet" or "side-inlet" distribution system, or the field has been graded flat.
3. Preparation and planting the fields using typical agricultural practices.
4. If necessary to germinate seed, "flushing" the field then allowing field to dry down and plants to grow to reach 5th leaf (1st tiller) stage before establishing full flood.
5. Flood the field based on typical triggers (i.e., plant growth stage, presence of weeds, soil moisture, etc.).
6. Implement a cyclical drying-wetting regime throughout the growing season as follow:
   a. Terminate irrigation and allowing the field to "dry down" to a saturated soil condition. For sloping fields, the upper 10% of each paddy should be allowed to reach the saturated soil condition.
   b. After dry-down, resume irrigation flooding to typical levels.
   c. Repeat the cycle throughout the growing season.
   d. Near the end of the season, terminate irrigation based on plant growth stage as recommended by the Land Grant University personnel and allow the field to "dry down" prior to harvest.
7. Comply with the requirements of the Conservation Practice Standard, Irrigation Water Management, Code 449.

Adoption Requirements

This enhancement is considered adopted when at the end of the growing season irrigation is complete and irrigation documentation has been verified.

Documentation Requirements

1. Record irrigation data such as location, date, duration, and flow rate of all irrigation operations.
2. Utilize dated digital photography to document "dry down" conditions. Each photo should indicate the field and location photo was taken.

References

Linquist, B. A., Anders, M. M., Adviento-Borbe, M. A. A., Chaney, R. L., Nalley, L. L., da Rosa, E.F.F. and van Kessel, C. 2014. Reducing greenhouse gas emissions, water use, and grain arsenic levels in rice systems. Global Change Biology. doi: 10.1111/gcb.12701

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