Sugarcane Genotype Response to Flooding soon after Planting or Harvesting

Barry Glaz
Canal Point, FL

Abstract

Sugarcane (*Saccharum* spp.) tolerance to short-duration flooding is an important agronomic issue in Florida due to the need to maintain BMPs for control of P discharge to the Everglades. In a 2-yr (plant cane and first ratoon) lysimeter test, 2 sugarcane genotypes were planted as subplots with water treatment as main plots. Water treatments were drainage depth (15 vs. 42 cm) x flood duration (0, 2, 4, and 6 d). Cane and sucrose yields were highest with 0 d flooding and at a 42 cm drainage depth in the plant-cane crop. However, for treatments that were flooded for ≥ 2 d, cane and sucrose yields were greater when lysimeters were drained to 15 rather than 42 cm. In first ratoon, cane and sucrose yields improved with 2 and 4 d of flooding and the optimum drainage depth was 42 cm. These results indicate that young sugarcane is more susceptible to periodic flooding than well established sugarcane; but that management of flood duration and drainage depth needs to differ in plant cane and first ratoon.

Issue

Rapidly growing sugarcane tolerates short-duration flooding well during the summer in Florida. However, little is known about the reaction of recently planted or recently ratooned sugarcane to flooding and shallow water-table depths prior to June 1.

Objective

Test the yields of two sugarcane genotypes exposed repeatedly to different flood durations and drainage depths soon after planting and ratooning.

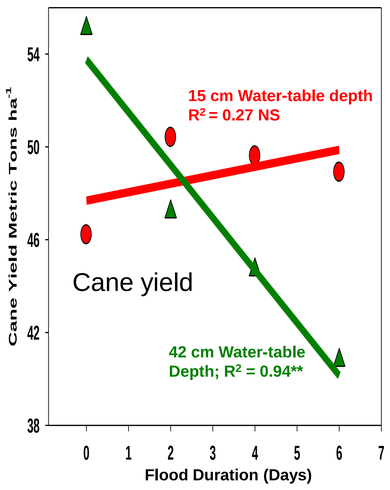
Materials and Methods

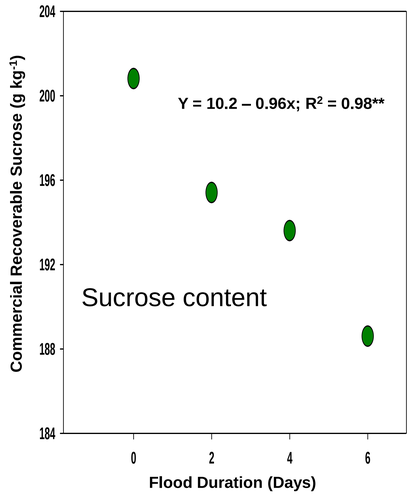
Water treatments (fixed effects) are main plots
2 Water-table depths: 15 and 42 cm
4 Flood durations: 0, 2, 4, and 6 days
2 Genotypes are sub plots:
CP 06-2400 and CP 06-2897

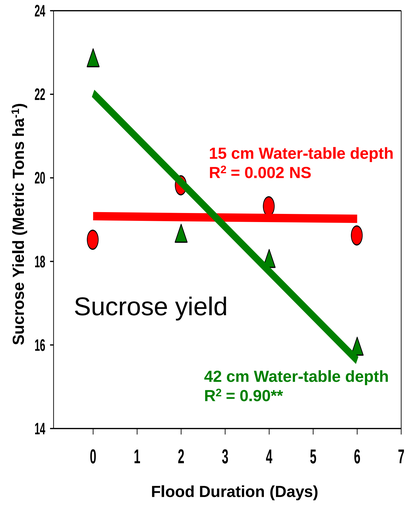
Water treatments applied from March-May. All lysimeters then maintained at constant 42 cm water-table depth until harvest in September.

4 Replications
Plant-cane crop
First-ratoon crop

Plant-cane crop







First-ratoon crop

Sugarcane at constant 42-cm drainage depth in plant cane

Sugarcane at constant 42-cm drainage depth in plant cane

Three cycles of 4-d floods + 1-wk drainage at 42 cm in plant cane

Three 3 cycles of 6-d floods + 1-wk drainage at 42 cm in plant cane

Conclusions

- Recently planted or ratooned sugarcane is more susceptible to short-duration flooding than well established sugarcane.
- In plant cane, as flood duration increased from 0 to 6 days, cane tonnage losses were linear with increasing flood duration if drainage was to 42 cm. If drainage depth was to 15 cm, there was no loss in cane tonnage.
- For sugarcane not exposed to flood, the optimum drainage depth was 42 cm in plant cane
- In first ratoon, flooding for 2 or 4 days resulted in higher cane yields than flooding for 0 or 6 days whether drainage depth was 15 or 42 cm.
- Based on the two sugarcane genotypes in this study, it appears that high yielding sugarcane genotypes in Florida may react differently to flooding and water-table depth when recently planted, particularly in sucrose content.
- Recently planted sugarcane and recently ratooned sugarcane differed in their reactions to flooding and shallow water-table depths when treatments were applied at the same growth stage.