

# CRANBERRY GROWTH AND YIELD COMPONENTS ARE IMPACTED BY IRRIGATION WATER CONTAINING SALT

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To investigate the potential negative effects of the migration of road salt runoff into cranberry irrigation ponds, cranberries were exposed to varied concentrations of chloride (Cl) in both greenhouse culture and in the field. Previous work by DeMoranville, Davenport, and Roper (as reported at the 2003 NACREW meeting) indicated adverse effects on cranberry soil and cranberry plants with exposure to chloride concentrations of 100 or 250 mg.l<sup>-1</sup>. These effects included changes to soil chemistry, visible symptoms on plant leaves, mild stimulation of runner growth, and suppression of flowering. However, these studies were conducted in greenhouse sand or soil-free culture and were not designed to examine crop yield.

Cranberries were grown in a sand-peat mix that mimicked field soils and were assigned to two experiments. In the first, plants were irrigated with solutions containing NaCl at Cl rates of 0, 50, 100, or 250 mg.l<sup>-1</sup>. In each 7-day period, treatments were applied for 6 days and on the 7<sup>th</sup> day, all treatments received water with no Cl to simulate periodic rain. In the second experiment, plants were irrigated with solutions containing NaCl at Cl rates of 0, 50, 100, or 150 mg.l<sup>-1</sup> on all days. As was the case for sand-grown plants in previous studies, there was greater runner biomass and fewer flowers produced on plants exposed to 250 mg.l<sup>-1</sup> Cl in 6 of each 7 days compared to control plants. When exposure increased to all days, plant biomass decreased linearly with increased Cl.

Field plots were established and were irrigated with 0, 50, 100, or 200 mg.l<sup>-1</sup> Cl as NaCl once per week in the cooler portions of the growing season and twice weekly during the summer. Treatments continued for two growing seasons. Plots were evaluated by analysis of soil and plant tissue samples, determination of upright density (using ring sampling technique), and by collecting fruit samples to determine number and weight of berries (yield). After two years, as Cl concentration increased, runner production increased linearly and yield decreased linearly. Cl exposure was associated with decline in upright density and aboveground biomass, decreased flowering and suppressed fruit set. Based on this research, growers should exercise caution when using irrigation water sources that have >100 mg.l<sup>-1</sup> Cl.