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An experiment was conducted in a controlled environment to evaluate the effect of three irrigation amounts on disease development and water use efficiency in sugar beet.

Three pathogen treatments, beet necrotic yellow vein virus (BNYVV), beet soilborne mosaic virus (BSBMV), BNYVV+BSBMV, a non-inoculated control and three irrigation amounts, pot capacity (PC), 75% PC and 50% PC, were arranged in a split plot design and replicated five times. Pots of each treatment were weighed every other day to determine evapotranspiration. Evaporation was determined from unplanted pots, and plant transpiration was calculated by the difference. The treatment irrigated at 75% pot capacity showed minimal disease incidence and a root weight comparable to the fully irrigated healthy control. Plants from BNYVV-infested seed had a significantly higher disease incidence than BSBMV and BNYVV+BSBMV treatments. Root weights and plant water use were significantly affected by the inoculation treatments. Beets in the BNYVV+BSBMV treatment had a significantly higher root weight and water use than beets in the BNYVV treatment suggesting competition between the two viruses.