Low-Volume Sprinklers for More Sustainable Water Use in Florida Strawberry Production

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The establishment of bare-root strawberry transplants in Florida's annual hill system requires a considerable amount of water for overhead irrigation. This is necessary to cool down the plastic mulch during the establishment period (late September to mid-October) when daytime air temperatures are still high, to prevent the bare-root transplants from undergoing desiccation due to their impaired root systems. Overhead irrigation is also used during freezing nights later in the season to limit yield loss due to frost and freeze injury to flowers and fruits. The high-water use of these two operations when conducted with the commonly used impact sprinkler system can have dire environmental impacts. Therefore, a more sustainable approach is necessary. This study aimed to conserve water during these operations by comparing four low-volume sprinklers with the impact sprinkler as the control. The low-volume sprinklers included the Jain Mini-Revolver (MR), the Netafim Supernet Jet (NS), the Senninger Mini-Wobbler (MW), and the Senninger Xcel Wobbler (XW). The experimental design was a randomized complete block with four replications. The on-station trial was conducted from October through March 2021-2022 and repeated in 2022-2023 at the Plant Science Research and Education Unit in Citra, FL, using the strawberry cultivar, Florida Brilliance. Sprinkler irrigation was applied for 10 hours per day for 11 days for transplant establishment. The four low-volume sprinklers significantly reduced water use by up to 79% for the establishment, with no adverse effects on strawberry transplant survival and vigor, vegetative growth, and yield. Significantly less water was used with the low-volume sprinklers during freeze protection, and up to 74% could be saved. Water use for both establishment and freeze protection with the MR and NS sprinklers was significantly lower than with the MW and XW sprinklers. However, two of the four low-volume sprinklers will require initiation of freeze protection at temperatures above 34 °F for effective frost protection.