Growth regulation and control of the weed purple nutsedge (Cyperus rotundus) are important components of Bermudagrass turf (BT) management in the Caribbean. Experiments were conducted in the Dominican Republic to evaluate the growth regulator trinexapac-ethyl (TE) and the herbicides imazaquin and halosulfuron in BT infested with purple nutsedge. The treatments were (1) control plots (no TE or herbicide application), (2) halosulfuron, (3) imazaquin, (4) TE without herbicides or (5) with halosulfuron or (6) imazaquin. Growth and appearance of BT, as well as purple nutsedge growth and survival, were measured every two weeks for eight months. As compared to control plots, BT and purple nutsedge growth were significantly lower in plots sprayed monthly with TE. When programs with halosulfuron or imazaquin were implemented, purple nutsedge survival was <5%, but BT growth was not significantly lower than in control plots. In terms of purple nutsedge control and BT appearance and growth suppression, programs combining TE and halosulfuron or imazaquin provided the best results.