

ABSTRACT

The main aim of this research is to study yield and growth responses of Tomato, Okra, and Chilli when subjected to heat and water stress and to determine how heat shock or water deficit, either individually or in combination, affect the growth and yield of crops. Experiments were conducted in three growing seasons in the low country wet zone as a replicated trial. The plants were grown in pots under temperature controlled poly tunnels. Main plots included two different wetting applications (no water stress, 50% water stress from the field capacity) and sub plots contained 3 different temperature regimes (34°C maximum temperature poly tunnel, 32°C maximum temperature poly tunnel, ambient temperature). Individual water stress showed highly significant effect on growth, and yield parameters of Okra. Significant yield reduction has showed in the water stressed plants. Further temperature stress has especially affected the pod quality parameters such as fibre and pectin content. Harvesting time of Okra under ambient temperature was not suitable for the high temperature conditions due to rapid pod growth rate and break down of the calcium pectate in 5 to 6 days after full blooming. Results indicated that Okra has high yield when it is grown under high temperature environment with no water stress. Therefore by maintaining irrigation at field capacity level even at high temperature stress conditions, it is possible to achieve a good yield by harvesting Okra pods in 5 to 6 day after full blooming without significant yield reduction. In Tomato, individual water stress showed highly significant effect on growth, and yield parameters. Tomato fruit setting was significantly reduced at 34°C maximum temperature due to pollen sterility. The combination effect of water and temperature stress proved to be significant different of Tomato growth, fruit quality, and the chemical composition of the fruit. During the fruit setting, early stage of ripening and at fruit growth, combination of temperature and water stress lead to severe yield reductions of the Tomato. Findings showed varying responses of Chilli to different combinations of water and temperature treatments. Individual water stress showed highly significant negative effect on growth and yield parameters of Chilli. High yield reduction has showed in the water stressed condition due to retardation of the overall plant growth and yield characters. According to the yield parameters it was observed that interaction

effect of the stresses of temperature and water had higher significant impact on growth and yield of the Chilli production. Yield reduction of Chilli due to temperature stress can be overcome by keeping the plant without water stress during growing period.