

Response of Yield and Morphological Characteristic of Rice Cultivars to Heat Stress at Different Growth Stages

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Abstract : The high temperatures during sensitive growth phases are changing rice morphology as well as influencing yield. In the glass house study, the treatments were: growing conditions [normal growing (32°C+2) and heat stress (38°C+2) day time and 22°C+2 night time], growth stages (booting, flowering and ripening) and four cultivars (Hovaze, Hashemi, Fajr, as exotic and MR219 as indigenous). The heat chamber was prepared covered with plastic, and automatic heater was adjusted at 38°C+2 (day) and 22°C+2 (night) for two weeks in every growth stages. Rice morphological and yield under the influence of heat stress during various growth stages showed taller plants in Hashsemi due to its tall character. The total tillers per hill were significantly higher in Fajr receiving heat stress during booting stage. In all growing conditions and growth stages, Hashemi recorded higher panicle exertion and flag leaf length. The flag leaf width in all situations was found higher in Hovaze. The total tillers per hill were more in Fajr, although heat stress was imposed during booting and flowering stages. The indigenous MR219 in all situations of growing conditions, growth stages recorded higher grain yield. However, its grain yield slightly decreased when heat stress was imposed during booting and flowering. Similar results were found in all other exotic cultivars recording to lower grain yield in the heat stress condition during booting and flowering. However, plants had no effect on heat stress during ripening stage.

Keywords : rice, growth, heat, temperature, stress, morphology, yield

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