Soybean (Glycine max (L.) Merrill.) contributes 57% of the total oilseed production worldwide. Sustainability of its production is severely challenged by drought, depressing up to 40% of the yield annually. Also Selection of drought-tolerant varieties based on morpho-physiological and biochemical attributes assisted with genomic approaches is one of the methods to be focused. To overcome this challenge, conventional and genomic approaches together with biochemical assays have been utilized for understanding drought tolerance mechanisms followed by utilization of this information for developing drought-tolerant soybean cultivars. In this experiment, material was monitored in randomized block design (RBD) with three replications. Sixty-day-old plants evaluated for various morpho-physiological parameters including biochemical parameters viz.: antioxidant enzyme activities and photosynthetic characteristics of soybean. Furthermore, the changes in photosynthetic and chlorophyll fluorescence characteristics, total soluble protein, total sugar and en-