



EDITORIAL

Drought Stress in Rice (*Oryza sativa* L.)

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Drought is one of the most important limiting factors for agricultural productivity and has a negative impact on global food security. Rice (*Oryza sativa* L.) is one of the most important staple food crop in the world. Most of improved rice varieties are vulnerable to drought stress.^[1] Drought stress is a very important factor for plant growth^[2-4]. Drought at vegetative stage reduced rice yield by 21-50.6%, at flowering stage by 42-83.7% and at reproductive stage by 51-90.6%^[5]. Drought conditions are caused by a combination of factors such as elevated temperatures, burning sunlight, and low relative humidity due to a lack of timely precipitation. Plants suffered from a lack of soil moisture and can no longer extract nutrients and water from the soil. Plant cells are killed due to external infiltration caused by higher ion concentrations in drought-affected soil. In the presence of water stress, leaf area, cell size, and intercellular volume are reduced^[6]. Drought stress slows down the photosynthetic process. Drought affects spikelet fertility and viable pollen production, pollen load, pollen shedding, germination and embryonic development. Drought reduces grain yield. Soil parameters that affect the growth and yield of rice, which grows primarily in lowlands affected by drought, need to be measured and

analyzed. Soil matric potential, hydraulic conductivity, bulk density, field capacity, and wilting points need to be measured for estimating water content of soil. When the matric potential of the soil is below zero, it reduces the water availability and water uptake by plants. Avoidance or tolerance can reduce the harmful effects of drought on plants. Drought tolerance refers to the ability of plants to provide high water potential and prevent dehydration despite the low water supply of the soil. Dehydration tolerance refers to a plant's ability to withstand minor water injury and internal water deficiencies. Another option for dealing with the drought is to escape. This is where the plant completes its life cycle long before the onset of drought, crop length is changed such that critical stages like panicle emergence do not coincide with expected drought periods. Proper and appropriate phenotyping plays an increasingly important role in the selection of drought-tolerant genotypes. It is necessary to develop early-maturing to escape the drought and develop drought-tolerant varieties that perform better under drought stress^[7]. Drought stress mitigation measures for the rice crop include improving and incorporating traits such as a deep root system, leaf rolling, cuticle wax, stomata location,

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Received: 23 March 2022; **Accepted:** 28 March 2022; **Published:** 31 March 2022

Citation: Shrestha, J., 2022. Drought Stress in Rice (*Oryza sativa* L.). *Research on World Agricultural Economy*. 3(1), 506. <http://dx.doi.org/10.36956/rwae.v3i1.506>

DOI: <http://dx.doi.org/10.36956/rwae.v3i1.506>

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and rapid recovery ability. Watershed improvement, as well as increased moisture availability via water conservation and harvesting, is crucial components. Drought forecasting and early guidance to farmers are critical drought mitigation methods that can help reduce the total cost of drought.

Conflict of Interest

There is no conflict of interest.

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