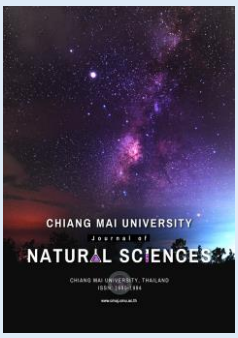

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Research article

Hydro- and Osmo-priming Effects on Upland Rice Exposed to Drought Conditions at Vegetative and Reproductive Stages

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Abstract Drought stress during vegetative and/or generative stages could cause massive reduction in rice yield. This study evaluated effectiveness of hydro- and osmo-priming on improving seed germination, growth and development of upland rice under drought stress during late vegetative, booting, or heading stage. Treatments consisted of hydro-priming and osmo-priming consisted of three polyethylene glycol (PEG) concentrations i.e. 10%, 15%, and 20%. Results showed that application of osmo-priming at 10% PEG required longer time (21.93 hours) to reach 50% germination, lower germination and lower vigor index. However, after germination, seeds primed with 10% PEG exhibited better seedling growth than other seed priming treatments. Effects of seed priming on yield components were overshadowed by drought exposures. Drought imposed during vegetative stage did not significantly affect yield; however, regardless of seed priming treatments, yield reduction was inevitable in rice plants exposed to drought during booting or heading stages. Rice plant shortened time to reached physiological maturity as an adaptive mechanism if drought treatment was applied during heading stage.

Keywords: Germination, Polyethylene glycol, Seedling growth, Seed priming, Yield component

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