



Alleviating the adverse effects of irrigation interval on seed yield, components and quality of Rapeseed (*Brassica napus* L.) by using potassium and proline

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Received 23rd July 2025; Accepted 15th December 2025; Available online 31st December 2025

Abstract: According of climate change condition in recent years, there has been an increasing in low precipitation and increased water deficit during winter period. So, a field experiment was conducted in winter session of 2023-2024 to evaluate the effect of irrigation period, applying of potassium and foliar application of proline on seed yield, components and quality of Rapeseed (*Brassica napus* L.). The experiment applied at agricultural research station, university of Basrah, Basrah, Iraq (30°34'4.80"N47°44'56.40"E). The experiment includes studying two factors, the first one is three periods of water irrigation: every 4, 8 and 12 days. The second factor is combined of potassium application (0, 25, 45 kg K₂O ha⁻¹) and foliar application of proline: (0, 25 mM proline). Split experiment was applied (3×6×3) according to randomized complete block design with three replicates. The total experiment unit was 54 with an area of 2×2 m². The results showed increased irrigation period (the increased water deficit) lead to reduced almost yield, components, and quality. The irrigation treatment of irrigate plants each 12 days lead to reduce potassium content by 5.64% while, increased proline content by 46.59%. Moreover, increased irrigation period led to reduced yield components which reflect negatively on reduce seed yield by 17.87% as compared to well-watered (irrigate plants each 4 days). Moreover, it led to reduce biological yield, protein% and oil% seed by 31.17%, 6.95% and 21.47% as compared to well-watered respectively. The result indicated that the application of potassium and foliar spraying of proline enhance seed yield, and quality of Rapeseed. The application of potassium 45 kg K₂O ha⁻¹ and foliar application of 25 mM proline increased potassium and proline content by 69.23% and 42.90% respectively. In addition, it was enhanced seed yield, protein%, Oil% and oil yield by 26.64%, 10.46%, 15.09% and 43.52% respectively.

Keywords: Rapeseed, irrigation period, potassium and proline, seed yield, oil yield

Introduction

Rapeseed (*Brassica napus* L.) is one of important crop in worldwide, the total production worldwide was 31.480 million tans for 2024-2026 growing season. It is a major

source of cooking oil for human consumption, with the variety low-acid cultivars being marketed as canola oil. Moreover, the oilseed meal, a byproduct of oil extraction, is a