The experiment was carried out in two vegetation seasons, 2009/2010 and 2010/2011, respectively. The main purpose of the study was to determine the effects phosphorus doses (a control-0, 30, 60 and 90 kg ha\(^{-1}\)) on grain yield, P-use efficiency, P-uptake and P-utilization of some bread wheat cultivars (Gerek-79, Gün-91, Harmankaya, Altay-2000, Yıldız and Sultan) under the semi-arid climatic conditions. The experiment was set up according to a Randomized Complete Block Design in a split-plot arrangement with three replicates, where phosphorus doses were main plots while the wheat cultivars were in subplots split within main plots.

Of the phosphorus doses, while the highest grain yield, the highest P-use efficiency and the highest P-utilization efficiency were determined from the 60 and 90 kg ha\(^{-1}\) P doses, the highest P-uptake efficiency was obtained from the 30 kg ha\(^{-1}\) P dose in both 2009/10 and 2010/11.

Of the wheat cultivars, the highest grain yield, the highest P-use efficiency, the highest P-uptake and the highest P-utilization were obtained from Altay-2000 and Gün-91 cultivars.

Of the interactions between the P doses and the wheat cultivars, the highest grain yield (2494-3649 kg ha\(^{-1}\) respectively), the highest P utilization efficiency (193.7 and 190.1 %, respectively) were obtained from the 60 and 90 kg ha\(^{-1}\), respectively, in Altay-2000 in both 2009/10 and 2010/11. The highest P-use efficiency was obtained from the 60 kg ha\(^{-1}\) in Gün-91 cultivar (34.8 %) during 2009/10 and Altay-2000 (36.4 %) during 2010/11. The highest P-uptake efficiency was determined from the 30 kg ha\(^{-1}\) in Gün-91 cultivar (52.8 and 44.9 %, respectively) in both years.