Lavandin (Lavandula × intermedia Emeric ex Loisel. var. Super) is cultivated in an area of about 320 ha in Isparta province of Turkey. This study was conducted to determine the effects of phosphorus fertilization at the levels of 0, 50, 100, and 150 kg ha⁻¹ on the yield characteristics, essential oil content and composition, and nutrient concentrations of lavandin (Lavandula × intermedia Emeric ex Loisel. var. Super) in 2010 and 2011 growing season. With an increase in the levels of phosphorus, the P, N, K, Ca and Fe concentrations increased in the leaves, while the Mg, Mn and Zn concentrations (p<0.01) decreased. On the other hand, the characteristics of plant height, branch number, flower height and fresh, dry and drug flower yields increased up to the level of 100 kg ha⁻¹ of phosphorus but decreased at the higher level. In comparison with the control application, the application of 100 kg ha⁻¹ of phosphorus increased the essential oil content approximately by 16%. Linalyl acetate, the main component of the essential oil, rose from 25.07 to 30.72% on average from the control application to the highest phosphorus application, whereas the rate of linalool decreased from 41.82 to 38.54%. Phosphorus fertilization significantly affected the nutrient contents as well as yield and quality characteristics of lavandin. Therefore, application of 100 kg ha⁻¹ of phosphorus may be suggested in lavandin to obtain the ideal yield and quality.