Ronweed (Vernonia galamensis) is a promising new crop for industrial oil but information on its response to fertiliser is scanty. A field experiment was conducted at the University of Nairobi Field Station farm during 2 seasons (January to May 1998, season 1 and March to August 1998, season 2) to determine the effects of nitrogen (N) and phosphorus (P) fertiliser rates on growth, photosynthetically active radiation (PAR) interception and seed yield of 2 Vernonia galamensis cultivars (ethiopica and gibbosa). N was applied at 0, 75 and 150 kg N/ha, and P at 0, 45 and 90 kg P2O5/ha. The experiment was a $2 \times 3 \times 3$ factorial laid out in a randomized complete block design with 3 replications. N and P application significantly increased total dry matter (TDM), photosynthetically active radiation (PAR) interception and leaf area index (LAI) of both varieties in late vegetative and reproductive stages. Gibbosa had consistently higher TDM, LAI, PAR and was taller compared to ethiopica throughout the growing season. Average seed yield of gibbosa was 2.3 times higher than that of ethiopica in both experiments. The highest TDM, LAI and seed yields were obtained at the highest N and P levels. Gibbosa had a significantly higher number of capsules/plant but a lower harvest index (HI) compared to ethiopica.