Summary

The effect of cutting date and phosphorus fertilization (applied as P_2O_5) on the synchronization of flowering, yield and yield components, and seed quality of *Brachiaria humidicola* CIAT 6133 was studied on an Oxisol located 40 km from Pucallpa, Peru, within the seasonal semi-evergreen forest ecosystem. Treatments were as follows: cutting dates (15 September, 1 and 15 October, and 1 and 15 November 1995) and three levels of P_2O_5 (50, 100, 150 kg/ha), distributed in a completely randomized design with two replicates. P was broadcasted after each cutting date. At the beginning of the trial, 50 kg N, 50 kg K, and 20 kg S were uniformly applied per hectare. Variables evaluated were phenology, number of spikes/m^2, no. of spikelets/spike at maximum flowering, 100-seed weight, seed yield, and production costs. Flowering occurred 66 days after the first cutting and 23 days after the last cutting. Days to harvest maturity after complete flowering ranged between 25 and 35. Cutting dates help synchronize flowering and harvesting, but they also affected plant height, number of spikelets and spikes, seed yield, and percentage of empty spikelets. P levels affected plant height and number of spikes/m^2. An interaction between cutting dates and P levels was observed in terms of 100-seed weight. The cut effected on 1 October, together with the application of 50 kg P_2O_5/ha produced the highest economic returns per hectare.