

ABSTRACT

This study aimed to determine the effect of applying cow manure and *Chromolaena odorata* L. green manure as well as their interaction on the growth and yield of peanut plants *Arachis hypogaea* L. The research was conducted at the Experimental Garden of the Faculty of Agriculture, Malikussaleh University, using a Randomized Block Design (RBD) with a two-factor factorial arrangement and three replications. The first factor was cow manure, consisting of three levels: 0 kg/plot, 6.75 kg/plot (25 ton/ha), and 8.1 kg/plot (30 ton/ha). The second factor was *Chromolaena odorata* green manure, also consisting of three levels: 0 kg/plot, 2.7 kg/plot (10 ton/ha), and 5.4 kg/plot (20 ton/ha). Observed parameters included plant height, number of leaves, number of branches, flowering age, stomatal length and width, stem diameter, number of root nodules, number of pods per plant, number of filled pods, 100-seed weight, dry seed weight per plot, and yield per hectare. The results showed that cow manure had a significant effect on plant height at 21 and 28 days after planting (DAP), flowering age, stem diameter at 14 DAP, number of pods per plant, and number of filled pods. The best results were obtained with treatment S2 (cow manure at 8,1 kg/plot). *Chromolaena odorata* green manure significantly affected plant height at 21 and 28 DAP, flowering age, number of pods per plant, and number of filled pods. The best results were obtained with treatment P2 (5,4 kg/plot of *Chromolaena odorata* green manure). The interaction between the two treatments influenced plant height at 21 and 28 DAP, number of pods per plant, number of filled pods, 100-seed weight, and yield per hectare. The best treatment combinations were observed as follows S2P0 (8,1 kg/plot cow manure + 0 kg/plot *Chromolaena odorata* green manure) for plant height, S0P1 (0 kg/plot cow manure + 2,7 kg/plot *Chromolaena odorata* green manure) for the number of pods per plant and the number of filled pods and S0P0 (0 kg/plot cow manure + 0 kg/plot *Chromolaena odorata* green manure) for dry seed weight and yield (ton/ha). In general, the application of cow manure and *Chromolaena odorata* green manure improved several growth parameters and yield components of the peanut plants.

Keywords: crop productivity, green biomass, organic fertilization, sustainable agriculture, soil fertility.