

EFFECTS OF MANUAL AND MECHANIZED BUSH CLEARING METHODS ON GROWTH PERFORMANCE OF MAIZE IN THE DERIVED SAVANNAH ZONE OF NIGERIA

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Abstract

Field experiment carried out to determine the effects of using tractor bulldozer for mechanized agricultural bush clearing on germination efficiency, growth and yield of maize in the derived Savannah zone of Nigeria is reported. The germination efficiency was determined fourteen days after sowing and the growth was determined by measuring the height thirty days after sowing. Yields were measured from the weight of dry grain matter obtained after harvesting. The field experiments were conducted in two locations (Ako Nike and Agu Ukehe) both in the derived Savannah zone of Nigeria. Each location was mapped into four blocks, with each block measuring 40 m by 40 m (0.16 ha) using Randomized Complete Block Design. Each block was further divided into four plots (replications). Each plot (replicate) measured 10 m x 10 m (0.01 ha). One plot in each block was cleared manually (slash and root picking). Other three plots in the block were cleared using three categories of tractors equipped with bulldozers. The tractors were models D6 which weighed 20612 kg with a gross power of 133 kW; D7 which weighed 30273 kg, gross power of 172 kW and D8 which weighed 39421 kg with gross power of 228 kW. The tractors were assigned to the plots in each block at random. The cleared areas were subjected to the same tillage treatment (ploughing and harrowing) using a 41 kW Ford tractor.

Results show that in both locations and for the four seasons manual clearing recorded the highest results in the parameters studied. The highest overall germination efficiency of 97 percent was recorded in the first season of 2013 at Ako Nike. This was followed by 93 percent germination efficiency in first season of 2012 also at Ako Nike. The least scores were obtained in the plots cleared using D8 model of crawler tractor which were 71 percent and 75 percent obtained in the first season of 2012 at Ako Nike and Agu Ukehe respectively. The heights of maize in the two locations were highest in