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**The Thesis Submitted for the Degree of Master of  
Science  
(In the field of Agroecology)**

Ecophysiological aspects of maize (*Zea mays* L.) and cowpea  
(*Vigna unguiculata* L.) intercropping, with emphasis on weed  
control

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## Abstract

In order to study the ecophysiological aspects, weed control and forage quality intercropping maize (*Zea mays* L.) and cowpea (*Vigna unguiculata* L.) an experiment was conducted based on a randomized complete block design with three replications at the Research Farm, University of Zabol in 2015. The experimental treatments were: sole cropping of maize, 100% maize + 15% cowpea, 100% maize + 30% cowpea, 100% maize + 45% cowpea, 100% maize + 60% cowpea and sole cropping of cowpea. Physiological and morphological differences between intercrop components affect their ability of using environmental resources, light interception and water. The results showed that intercropping systems had a significant effect on environmental resources consumption, where intercropping systems had more light interception and water compared to sole crops. Maximum absorption of photosynthesis active radiation in the canopy cropping system 100% maize + 60% cowpea and also the cropping systems mixed, soil temperature was lower compared to sole cropping. using resources more efficiently absorb light and moisture in the mixed cropping systems to reduce weed biomass was, The highest weeds biomass in sole cropping cowpea with 193.6 g/m<sup>2</sup>. Lowest weed biomass in mixed cropping of maize 100% + 60% cowpea with 146.74 g/m<sup>2</sup> was. Results showed that, concentrations crude protein and ash maize mixed with cowpea increased, concentrations cell wall and acid detergent fiber (ADF) maize was reduced. The highest protein content (%9.41), dry matter digestibility (72.77), and ash (12.16) were obtained from mixed 100% maize + 60% cowpea. The highest neutral detergent fiber (46.66%) and ADF (26.66%) were obtained from sole cropping maize. Due to the negative correlation between the ADF and DMD. Reduce ADF, Cause increase the digestibility dry matter. The highest dry matter yield of treatment 100% maize + 60% cowpea With (14.61 t.h<sup>-1</sup>), while the least yield was obtained from the culturing of cowpea (0.93 t.h<sup>-1</sup>). Intercropping systems showed superiority over pure cultures in terms of qualitative and quantitative production of forage. , in the rhizosphere mixed cropping systems pH reduce and ions (N, P, K, Ca, Mg) increased, which shows the positive effect legume species is, by being in intercropping with maize Chemical Properties Soil and soil structure improved.

**Key words:** Biomass, Chemical Properties Soil, Cropping systems, Crude protein, Dry matter production, Soil temperature, Sources growth