

**PHYSIOMORPHOLOGIS RESPONSE OF COWPEA
(*Vigna unguiculata* L.)
AT VARIOUS OF SOIL MOISTURE CONTENT**

Lead and Islamic

Siti Hartono, Agus Nurrahma Salsariani, & Nurrahmah Nurrahmah
Department of Agronomy, Faculty of Agriculture, Universitas Muhammadiyah Semarang



Abstract

A research was carried out to know morphophysiology character and soil moisture content tolerance of cowpea at various of growth stages. The research was conducted at Green House and Research Laboratory of Agriculture Faculty of Universitas Muhammadiyah Yogyakarta from January to April 2016. The research was arranged in a field research method with one factor design in a Completely Random Design. The treatment was consisted of soil moisture content i.e. 100%, 75%, 50%, 25% of water were each add in vegetatif stage, flowering stage and podding stage. The result of the research showed that soil moisture content at various of growth stages has non significant influence to physiormorphologis character of cowpea, except to flowering dates and relative growth rate in vegetatif stage. Soil moisture content at 25% of water was significant to accelerated of flowering dates and significant to decreased of relative growth rate. Cowpea has tolerance to soil moisture content until 25% of water at various of growth stages.

Keywords: Cowpea, Physiormorphologis, Soil Moisture Content, Growth Stages.

Introduction

The crop that plant in a dry land should have a high tolerance over drought. One of crops resistant to drought comes from bean family, is cowpea. The best thing of cowpea is its low grease degree, so it could minimalize the negative effect of using grease food product. Cowpea also contains higher B1 vitamin than green pea. According to Bean/Cowpea CRSP West Africa Mission, cowpea is known well-tolerant over drought compare to soybean or green pea because it tends to have deep root. It can grow in a dry area, even with only 300 mm rainfall (Gomez, 2004). Nonetheless, it shows different morphophysiology reaction in every different level of soil moisture content in every growth stage. This research was carried out to know morphophysiology character and soil moisture content tolerance of cowpea at growth stage.

Method

The research was conducted at green house and research laboratory of agriculture faculty of Universitas Muhammadiyah Yogyakarta from January to April 2016. The material is cowpea seed varieties KT-6. The research was arranged in a field research method with one factor design in a completely random design. The treatment was consisted of soil moisture content i.e 100%, 75%, 50%, 25% of water supply were each add in vegetatif stage, flowering stage and podding stage.

Results

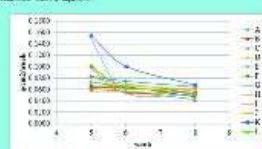
The result of this research shows different degree of soil moisture content in different growth stage render insignificant influence over height of crop, rod diameter, number of leaf, leaf area, weight of fresh plant canopy, shoot dry weight, fresh root weight, root dry weight, root volume, net assimilation rate, leaf area ratio, specific leaf area, shoot root ratio, number of pod each crop, number of seed each crop, number of seed each pod, pod weight each crop, seed weight each crop, seed weight each pod. However it shows significant influence over flowering age (Table 1) and net assimilation rate at vegetative stage (Table 2 and Pic 1).

Table 1. The Flowering Age of Cowpea (Age)

Treatment	Flowering Age (day)
SMC 100% water supply at vegetative stage	38,70 a
SMC 75% water supply at vegetative stage	38,67 a
SMC 50% water supply at vegetative stage	37,33 ab
SMC 25% water supply at vegetative stage	37,33 a
SMC 100% water supply at flowering stage	20,22 a
SMC 75% water supply at flowering stage	20,22 a
SMC 50% water supply at flowering stage	20,22 a
SMC 25% water supply at flowering stage	20,22 a
SMC 100% water supply at podding stage	28,67 b
SMC 75% water supply at podding stage	28,67 b
SMC 50% water supply at podding stage	28,67 b
SMC 25% water supply at podding stage	28,67 b

Table 2. Net Assimilation Rate of Cowpea (g/m²/day)

Treatment	Net Assimilation Rate (g/m ² /day)
SMC 100% water supply at vegetative stage	0,0022 a
SMC 75% water supply at vegetative stage	0,0022 a
SMC 50% water supply at vegetative stage	0,0022 a
SMC 25% water supply at vegetative stage	0,0022 a
SMC 100% water supply at flowering stage	0,0022 a
SMC 75% water supply at flowering stage	0,0022 a
SMC 50% water supply at flowering stage	0,0022 a
SMC 25% water supply at flowering stage	0,0022 a
SMC 100% water supply at podding stage	0,0022 a
SMC 75% water supply at podding stage	0,0022 a
SMC 50% water supply at podding stage	0,0022 a
SMC 25% water supply at podding stage	0,0022 a



Pic 1. Net Assimilation Rate

Table 3. Net Assimilation Rate of Cowpea (g/m²/day)

SMC 100% water supply at vegetative stage	0,0022 a
SMC 75% water supply at vegetative stage	0,0022 a
SMC 50% water supply at vegetative stage	0,0022 a
SMC 25% water supply at vegetative stage	0,0022 a
SMC 100% water supply at flowering stage	0,0022 a
SMC 75% water supply at flowering stage	0,0022 a
SMC 50% water supply at flowering stage	0,0022 a
SMC 25% water supply at flowering stage	0,0022 a
SMC 100% water supply at podding stage	0,0022 a
SMC 75% water supply at podding stage	0,0022 a
SMC 50% water supply at podding stage	0,0022 a
SMC 25% water supply at podding stage	0,0022 a

Conclusion

The soil moisture content in different growth stage render insignificant influence over height of crop, rod diameter, number of leaf, leaf area, weight of fresh plant canopy, shoot dry weight, fresh root weight, root dry weight, root volume, net assimilation rate, leaf area ratio, specific leaf area, shoot root ratio, number of pod each crop, number of seed each crop, number of seed each pod, pod weight each crop, seed weight each crop, seed weight each pod. However it shows significant influence over flowering age (Table 1) and net assimilation rate at vegetative stage (Table 2 and Pic 1).

References

Gomez, C. 2004. Cowpea. In: Bean/Cowpea CRSP West Africa Mission. <http://www.cowpea.org/>. Accessed 10 May 2015.

Documentation

