


[Home](#) > [Journal](#) > [Earth & Environmental Sciences](#) > AS

[Indexing](#) | [View Papers](#) | [Aims & Scope](#) | [Editorial Board](#) | [Guideline](#) | [Article Processing Charges](#)

AS > Vol.2 No.3, August 2011



Influence of phosphorus on the performance of cowpea (*Vigna unguiculata* (L) Walp.) varieties in the Sudan savanna of Nigeria

PDF (Size: 204KB) PP. 313-317 DOI: 10.4236/as.2011.23042

Author(s)

A. Singh, A. L. Baoule, H. G Ahmed, A. U. Dikko, U. Aliyu, M. B. Sokoto, J. Alhassan, M. Musa, B. Haliru

ABSTRACT

Savanna regions of Nigeria are deficient in nitrogen and phosphorus, which retard the growth and yield of crops. Therefore, a study was conducted in the wet season of 2006 at the Dry Land Teaching and Research Farm of Usmanu Danfodiyo University, Sokoto to evaluate the effect of phosphorus on the growth and yield of two cowpea varieties sourced from Republic of Niger. Treatment consisted of four (4) rates of phosphorus (0, 20, 40, 60 kg.ha⁻¹) factorially combined with (2) varieties of cowpea (kvx303096G and TN5-78) and laid out in a randomized complete block design (RCBD) replicated three (3) times. Results showed significant response to applied P on pods per plant, grain and stover yield and 100-seed weight with highest response to the application of 60 kg.P.ha⁻¹. From this study it can be concluded that Kvx303096G and TN5-78 could both be sown under Sokoto condition to obtain reasonable yield of about 1 t.ha⁻¹ of grain and 1.6 t.ha⁻¹ of stover. Irrespective of the varieties, application of 60 kg P₂O₅ ha⁻¹ could be recommended for higher yield of cowpea (1.4 t.ha⁻¹) relative to 0 kg.P.ha⁻¹ that yielded 1.0 t.ha⁻¹.

KEYWORDS

 Cowpea [*Vigna Unguiculata* (L.) Walp.]; Phosphorus; Sudan Savanna; Nigeria

Cite this paper

Singh, A. , Baoule, A. , Ahmed, H. , Dikko, A. , Aliyu, U. , Sokoto, M. , Alhassan, J. , Musa, M. and Haliru, B. (2011) Influence of phosphorus on the performance of cowpea (*Vigna unguiculata* (L) Walp.) varieties in the Sudan savanna of Nigeria. *Agricultural Sciences*, 2, 313-317. doi: 10.4236/as.2011.23042.

References

- [1] FAO (Food and Agriculture Organisation) (2005). Cowpea production data base for Nigeria 1990-2004. Available at <http://www.faostat.fao.org/>. Accessed on 26/03/2011.
- [2] IITA (International Institute of Tropical Agriculture) (2003). Crop and Farming Systems. Available at <http://www.iita.org/crop/cowpea.htm>. Accessed on 26/03/2011.
- [3] Adegbola, A. M. and A. K. Akinsanmi (1971). "Agricultural sciences for West African schools and Colleges", Oxford University, 3rd edition Ibadan. 365 p.
- [4] Bressani, R. (1985). "Nutritive value. In: Cowpea Research Production and Utilization". Edited by Singh S. R. and Rachies K. O., John Wiley and Sons New York USA.
- [5] Singh, B.B., O.L. Chambliss and B. Sharma. (1997). "Recent advances in cowpea breeding", pages 30-49, In: Advances in Cowpea Research, edited by B.B. Singh, D.R. Mohan Raj, K.E. Dashiell, and L.E.N. Jackai. Copublication of International Institute of Tropical Agriculture (IITA) and Japan International Research Center for Agricultural Sciences (JIRCAS). IITA, Ibadan, Nigeria
- [6] Tarawali, S.A., B. B. Singh, S.M. Peters, and S.F. Blade (1997). "Cowpea haulms as fodder", pages 313-325. In: Advances in cowpea research, edited by B.B. Singh, D.R. Mohan Raj, K.E. Dashiell, and L.E.N. Jackai. Copublication of International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria, and Japan International Research Center for Agricultural Sciences (JIRCAS). IITA, Ibadan, Nigeria.
- [7] Singh, B. B. and S. A. Tarawali (1997). "Cowpea: an integral component of sustainable mixed

- [Open Special Issues](#)
- [Published Special Issues](#)
- [Special Issues Guideline](#)

[AS Subscription](#)
[Most popular papers in AS](#)
[About AS News](#)
[Frequently Asked Questions](#)
[Recommend to Peers](#)
[Recommend to Library](#)
[Contact Us](#)

Downloads:	137,807
Visits:	297,313

Sponsors, Associates, and Links >>

[2013 Spring International Conference on Agriculture and Food Engineering\(AFE-S\)](#)

crop/livestock farming systems in West Africa and strategies to improve its productivity" , pages 79–100. In: Crop residues in sustainable mixed crop– livestock farming systems, edited by C. Renard. CAB International in association with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and the International Livestock Research Institute (ILRI).

- [8] Rachies, A. K. (1985). " Problems prospects of cowpea production in Nigeria Savannah" . Tropical Grain Legumes Bulletin, 32, 78-87.
- [9] IITA (International Institute of Tropical Agriculture) (1973-1974) Annual Report. 276 p.
- [10] Reamaekers, R. H. (2001). Crop Production Tropical Africa. DGIC, Belgium, 334-347 Pp.
- [11] Smyth, T. J. and M.S. Cravo (1990). Critical phosphorus levels for corn and cowpea in a Brazilian Oxisol. Agronomy Journal, 82, 309-312.
- [12] Adetunji, M.T. (1995). " Equilibrium phosphate concentration as an estimate of phosphate needs of maize in some tropical Alfisols" . Tropical Agriculture,72, 285– 289.
- [13] Muleba, N. and H.C. Ezumah(1985). " Optimizing cultural practices for cowpea in Africa" . 1985, Pages 289– 295. In: Cowpea research, production, and utilization, edited by S. R. Singh and K.O. Rachie. John Wiley and Sons Ltd, Chichester, UK.
- [14] Kang, B.T. and M. Naggos (1983). " Phosphorous Requirement of Cowpea. IITA Ibadan, Annual Report, 79-115pp.
- [15] Mokwunye, A. U., S. H. Chien, and E. Rhodes (1986). " Phosphorus reaction with tropical African soils" , pages 253– 281. In: Management of nitrogen and phosphorus fertilizers in sub-Saharan Africa, edited by A.U. Mokwunye and P.L.G. Vlek. Martinus Nijhoff Publishers, Dordrecht, The Netherlands.
- [16] FAOSTAT. (2004). Cowpea production data base for Nigeria 1990-2004. <http://www.faostat.fao.org/cowpeayield/cowpeaproduction>
- [17] Arnborg, T. (1988). " Where Savannah Turns into Desert. International rural Development center" , Swedish University of agriculture Sciences rural Development studies No 24, 23p.
- [18] SAS (2003). Statistical Analysis System. SAS Release 9.1 for windows, SAS Institute Inc.Cary, NC, USA.
- [19] Mokwunye, A.U., Bationo A (2002). Meeting the phosphorus needs of the soils and crops of West Africa: the role of indigenous phosphate rocks. In: B Vanlauwe, Diels J, Sanginga N, Merckx R (eds) Integrated Plant Nutrient Management in Sub-Saharan Africa: from Concept to Practice. CABI/IITA publication, Cromwell Press UK, pp 209-224, 352 pp
- [20] Okeleye, K., O. J., Ariyo and V.I., Olawe (1999). " Evaluation of early and medium duration (Vigna unguiculata L.) cultivars for organic trails and grain yield" . The Nigerian Agricultural Journal, 30, 1-11
- [21] Okeleye, K. A. and M. A. O. Okelana (1997). " Effect of phosphorus fertilizer on nodulation, growth and yield of cowpea (Vigna unguiculata) varieties" . Indian Journal of Agricultural Science, 67(1), 10– 12.
- [22] Kang, B.T. and O.C. Osiname (1979). " Phosphorus response of cowpea grown on alfisols of southern Nigeria" . Agronomy Journal, 71, 873-877.