Runoff water harvesting for dry spell mitigation for cowpea in the savannah belt of Nigeria.

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Abstract.

Cowpea yields obtained by smallholder farmers in the savannah belt of Nigeria are often less than the maximum obtainable yields because water deficit during critical growth stages is a common occurrence. Runoff harvesting to supplement direct rainfall may prove beneficial in improving current smallholder farming systems in this region. We study the effects of macro- and micro-catchments runoff harvesting, with or without in situ soil conservation, on cowpea yield in the savannah belt of Nigeria. The macro-catchments runoff harvesting (RH) experiment consisted of four treatments: conventional tillage and RH(CRH), zero tillage with RH (ZRH), reduced tillage with RH (RRH) and the direct rainfed (DR) treatment which served as the control in a randomized block design with four replicates. The micro-catchment experiment consisted of four treatments: runoff harvesting (RH), semi-circular bunds (SC), semi-circular bunds with runoff harvesting (SRH) and also direct rainfed (DR) in a randomized block design with four replicates. Results suggest that runoff harvesting can be used with existing conservation techniques. Applying harvested runoff water through supplemental irrigation provides the twin benefits of alleviating the prevailing slack periods and improving the yields of smallholder farming systems.

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