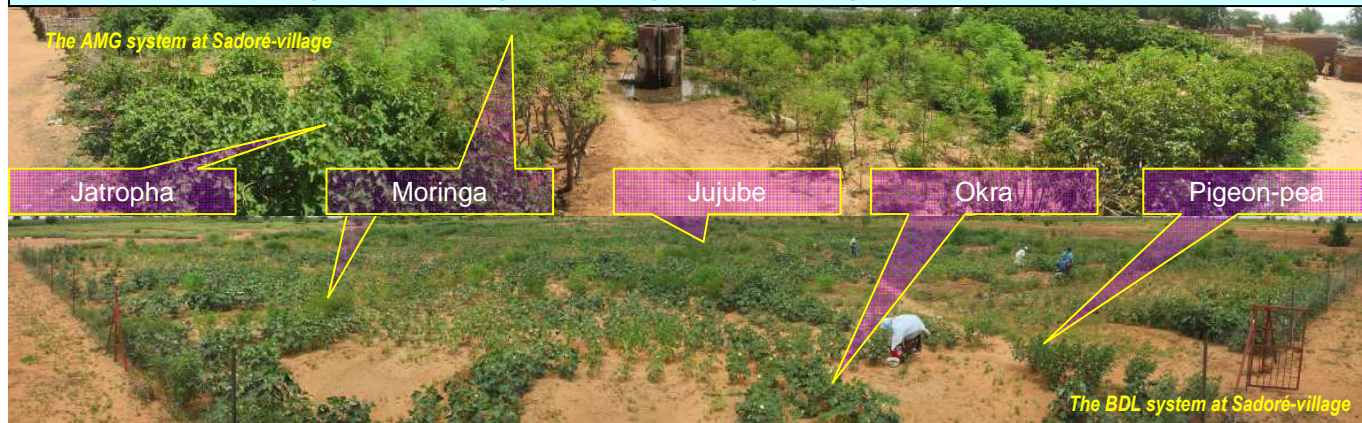


# New ecological options for the management of horticultural crop pests in Sudano-Sahelian agroecosystems of West Africa

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Further to earlier studies on the agroecological management of annual crop pests in Niger[1], presented studies highlight the potential for mobilizing aerial and soil-bound ecological processes for managing the main pests of grafted jujube and Moringa trees, the major perennial species in the rainwater harvesting-based Bio-Reclamation of Degraded Lands (BDL) system[2], Moringa being also popular in the drip irrigation-based African Market Gardens (AMG)[3]. Both BDL and AMG are promoted by ICRISAT as water-saving, food-securing and income-generating cropping systems for Sudano-Sahelian Africa.



## Management of Moringa leaf-feeding worm



Noorda sp. larvae feed on Moringa leaves and pupate in the sand, but may also daily migrate to the sand at hot hours, and climb back on trees at night during larval development. Hence prospects for pest management by pupa destruction, either physically or via soil antagonist enhancement, and by physical barriers on tree trunks.

## Management of Jujube fruit fly

*Carpomya incompleta*, the only fruit fly species emerging from jujubes at Sadoré, pupates in sand.



Fig.1. Effect of spot spraying with GF-120 of *Ziziphus mauritiana* (cv. Umran and Kaithly) on fruit fly damage (Sadoré, Niger, 2009). Means with the same letter are not significantly different (Newman-Keuls test at  $P = 0.05$ )

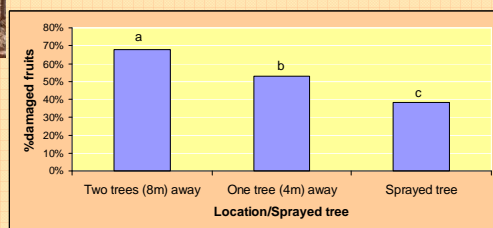
Table 1. Abundance of fruit flies recorded in two baiting experiments at Sadoré

Fruit fly spp.	<i>Carpomya incompleta</i>	<i>Ceratitis cosyra</i>	<i>Dacus</i> spp.	<i>Bactrocera cucurbitae</i>
Bait experiment				
GF-120 spot sprays on jujube (Sep 2009)	+	+++	++	+
GF-120 spot sprays on mango (Jun 2010)	0	++	+	0

Hence prospects (besides sanitation, physical destruction or soil antagonist activity enhancement against puparia) for dual-purpose use of spot-spraying with GF-120 to repel jujube monophagous fruit flies and "attract & kill" polyphagous fruit flies damaging other fruit trees.

A significant repellent effect of GF-120 (a mixture of food attractant and the biological insecticide Spinosad®) applied as « spot-spray » was shown (Fig.1).

GF-120 was attractive and lethal for the mango fruit fly *Ceratitis cosyra* (Table 1).



## Potential of « service » perennials Pigeon-pea

In absence of infestation in 2009 by *Helicoverpa armigera*, the Tomato fruitworm (TFW) on the Sadoré-village BDL, annual pigeon-pea borders did not negatively affect okra yield, and produced seeds during part of the dry season. A survey on the social acceptability of perennial cultivars of this crop is underway.

**Physic nut**  
 Jatropha plantations at Icrisat-Sadoré did not shelter horticultural crop pests, e.g. TFW, although many adult moths were trapped in the vicinity. Further to its potential role in conservation biological control of horticultural crop pests, Jatropha can also be used via its extracts in an assisted push-pull strategy, including vs TFW.

**Future prospects:** Other non-chemical options for Moringa leaf-worm and jujube fruit fly control should also be tested, e.g. neem extracts could be used as repellents on both pests, in combination ("assisted push-pull") with resp. spot-spraying in the case of fruit flies, and trap-cropping in that of TFW. Neem tree, being traditionally grown as a wind break around fruit tree orchards, can be considered, like Jatropha, as a service perennial for Sudano-Sahelian horticultural systems.

## References:

- [1] Ratnadass, A., et al. 2009a. Proc. 18th AAIS Conference, 16-20 Nov 2009, Ouagadougou;
- [2] Pasternak D., et al. 2009. Chronica Hort. 49:24-26;
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