FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

Findings and outcomes of pre-harvest research in Haiti, Ghana, Zambia, Malawi and Mozambique during the 2012-2016 project term for the Peanut & Mycotoxin Innovation Lab.

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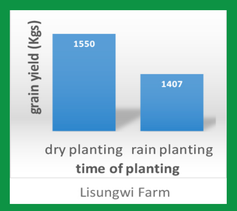
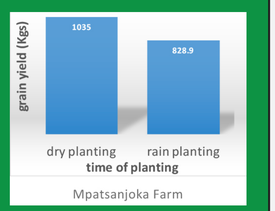
Numerous factors impact the size and quality of the crop that smallholder farmers are able to produce in five target countries that are the main focus of the Peanut and Mycotoxin Innovation Lab (PMIL). Near the end of a five-year program of research involving scientists in the U.S. and abroad, value chain projects in Haiti, Ghana and southern Africa have shown the impact certain pre-harvest interventions will have on yield and aflatoxin contamination under certain weather conditions. The findings of that research are the basis for interventions introduced to smallholders and on-going analysis of the effectiveness of those interventions in real-world circumstances.

PLANTING DATE

Peanuts are planted manually in Africa and in rainfed areas. Labor availability early in the rainy season is a limiting factor on timely planting.

Data suggests that planting prior to the rain (dry planting) may be a viable option to optimize labor without sacrificing yield. In trials in Malawi, dry planting resulted in 10-25% higher yield than planting after rain.





PLANTING DENSITY

Peanut is a low-input crop and seed costs represent a large portion of production costs, leading farmers to reduce plant populations. Data suggests yields will increase under denser plant stands ; however, environmental conditions, like rainfall led to variability of yield response relative to costs. (Lydia Mkandawire, Lilongwe University of Agriculture and Natural Resources)

OPTIMIZATION OF INPUTS

In Africa, farmers have little to no available capital for inputs. Demonstrating the ROI for inputs (including the cost of additional labor) is necessary to encourage adoption.

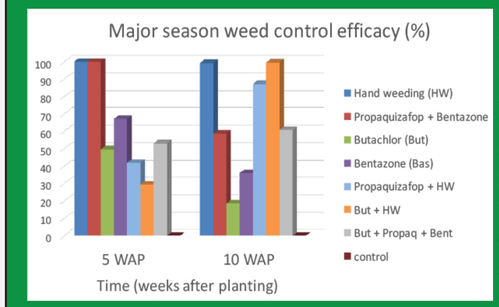
Interventions such as herbicides, extra weeding and fungicide can greatly increase yields, but timing, number of applications and rates must be tied to yield improvements to ensure

Yield and Economic Return
64 farmers in Northern Ghana

2014-2015 seasons	Pod Yield	Economic Return
	Kg/ha	$/ha
Best Management Practice	1900	$762.70
Farmer Practice	1540	$619.13

In trials in the Northern Ghana villages of Drobonso and Ejura in 2014 and 2015, enhanced practices including applying alata soap for aphid and leaf spot suppression and oyster shells for calcium, as well as performing one additional weeding, drying nuts on a tarp and storing in hermetic bags storage) resulted in a 23% yield increase. (David Jordan, North Carolina State University)

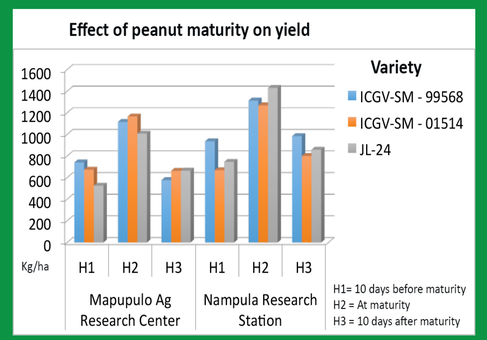
Herbicide application evaluations in Ghana reduced weed control labour time by 96-100% and an herbicide – manual weeding integration, by 55-70% over manual weeding (64 -67 man-days /hectare/season). Cost of manual weeding was $180-$375 depending on farmer practice, while herbicide-manual weeding integration reduced manual weed control cost by 26-66%. (Stephen Arthur, Kwame Nkrumah University of Science and Technology)



HARVEST TIMING

Harvest labor is limited by the fact that other crops may be mature at the same time, completing for a farmer's time and limited ability to hire outside labor. Many farmers opt to harvest high-value crops first, leaving mature peanuts in the ground for some time, but research shows that untimely harvest costs farmers in yield potential and quality.

Study results from Mozambique indicate that harvesting at physiological maturity gave the highest groundnut pod and kernel yield than harvesting 10 days before and 10 days after physiological maturity. Indicating that harvesting at physiological maturity, especially when the soil still contains little moisture, will help minimize pod yield losses in groundnut. (Emmanuel Zuza, Universidade Eduardo Mondelane)



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