



Nitrogen Rate and Variety Effect on Profitability of Maize Production in Northern Ghana

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Key research activities

Split-plot design with 2 nitrogen (N) fertilizer rates (Recommended= 60 kg/ ha N: 250 kg/ha NPK + 125 kg/ha SA as top dressing and Higher rate= 90 kg/ ha N: 250 kg/ha NPK + 250 kg/ha SA as top dressing) as main plot and 6 maize varieties (Abontem, TZEE W STR QPM CO, Abrohema, Omankwa, Obatampa, and DT SR W CO F2) as subplots. Grain was measured and gross margin and benefit cost (BCR) were estimated.

Results and main findings

- N fertilizer rate by maize variety interaction was not significant.
- N fertilizer rate affected grain yield, gross margin and BCR (Table 1).
- Majority of farmers preferred applying 90 kg/ ha N to maize than 60 kg/ha N (Fig. 1).
- Maize varieties affected grain yield, gross margin and BCR (Table 2).

Implications of the research for generating development outcomes

- Application of 90 kg/ ha N may be used for improve yield production of maize in Northern Ghana.
- DT SR W CO F2 and TZEE W STR QPM CO may be released as varieties and promoted for improve yield of maize in Northern Ghana.

How this work would continue in Africa RISING phase 2

Results from this study can be used for scaling-up activity in Africa RISING phase 2 to improve maize productivity in in northern Ghana.

Current partnerships and future engagements for out scaling

Current : Ministry of Food and Agriculture (MoFA)

Future: Agricultural Technology Transfer project (ATT)

Table 1: Effect of N fertilizer rate on grain yield, gross margin and benefit cost ratio

N rate (kg/ ha)	Grain yield (kg/ ha)	GM (\$/ ha)	BCR
60	3450.5	96.0	1.2
90	2744.1	196.8	1.3
s.e	137.80	31.80	0.05
P-value	0.0006	0.0114	0.0178

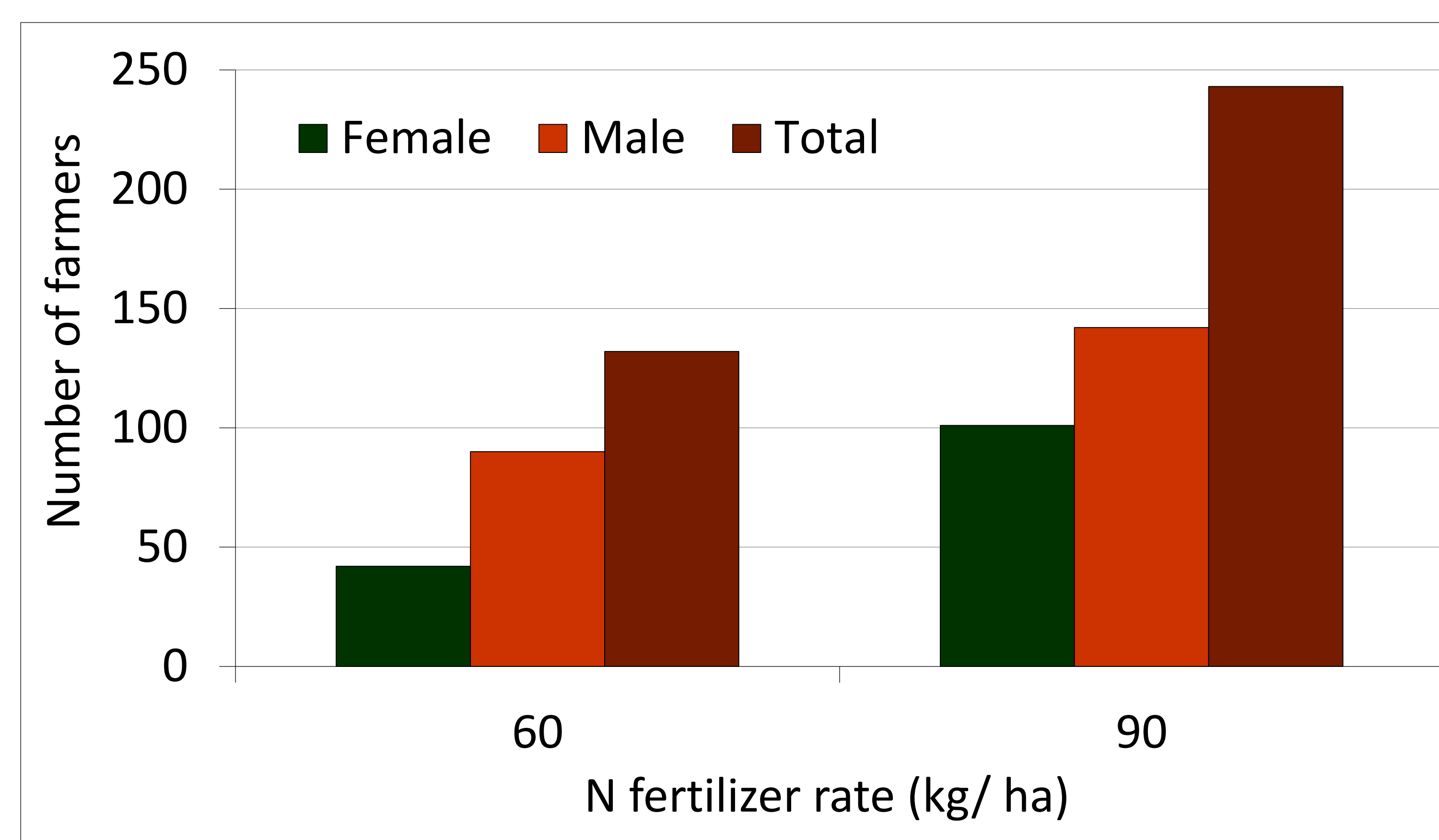


Fig. 2: Farmer preference for N fertilizer rate

Table 2: Effect of maize variety on grain yield, gross margin and BCR

Variety	Grain yield (kg/ ha)	GM (\$/ ha)	BCR
DT SR W CO F2 ^{m*}	3448.0	227.3	1.4
TZEE W STR QPM CO ^{ee*}	3410.7	218.7	1.4
Obatanpa ^m	3165.7	162.2	1.3
Abrohema ^e	3025.6	129.8	1.2
Omankwa ^e	2884.3	97.3	1.2
Abontem ^{ee}	2649.4	43.1	1.1
s.e	231.61	53.45	0.09
P-value	0.0038	0.0038	0.0041

ee= extra early, e= early, m= medium and *= unreleased
\$1= GHS 3.9



The Africa Research In Sustainable Intensification for the Next Generation (Africa RISING) program comprises three research-for-development projects supported by the United States Agency for International Development as part of the U.S. government's Feed the Future initiative.

Through action research and development partnerships, Africa RISING will create opportunities for smallholder farm households to move out of hunger and poverty through sustainably intensified farming systems that improve food, nutrition, and income security, particularly for women and children, and conserve or enhance the natural resource base.

The three projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (in the Ethiopian Highlands). The International Food Policy Research Institute leads an associated project on monitoring, evaluation and impact assessment.

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