



Plant Population Study in Maize

STUDY CONTACT:

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OBJECTIVE:

The objective of this study was to evaluate the effect of different plant populations on maize yield.

STUDY DESIGN:

Yield was measured from three treatments that included different seeding rates; 55,000 (farmer standard rate), 50,000 (-10%), or 60,000 (+10%) seeds/ha. Treatments were planted using the MF 9812 (Figure 2) precision planter at the AGCO future farm in Zambia in the 2018/2019 season.

RESULTS:

Overall grain yield was lower than average due to very low precipitation in this region during the 2018/2019 cropping season. Planting at 50,000 seeds/ha resulted in the highest yield (6.6 tons/ha), compared to planting at 60,000 (6.0 tons/ha) or 55,000 (5.93 tons/ha) seeds/ha (Figure 1).

The optimum planting population that returns the highest yield is determined by several factors, such as soil yield potential and weather conditions. In this trial, soil moisture was limited due to droughty conditions, which likely favored a lower optimum plant population with less competition between plants for water.

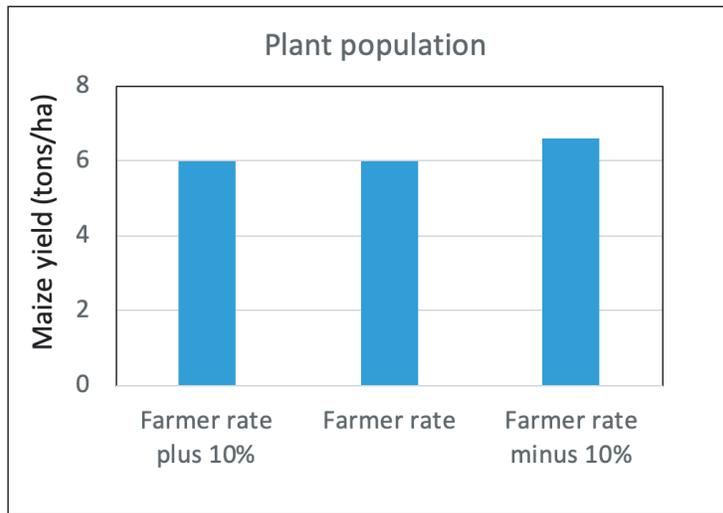


Figure 1: Maize yield in tons/ha dry matter at harvest. Maize was planted with different target plant population – farmer rate (55000plants/ha), farmer rate plus and minus 10% and harvested at maturity.



Figure 2: MF 9812 (12 row) precision planter at work at the AGCO future farm in Zambia.



Figure 3: Maize planted using the MF 9812 (12 row) precision planter at different target population. Here, farmer rate - 10% with best results.

ADDITIONAL OBSERVATIONS:

Because of the reduced precipitation in the 2018/2019 season, yield expectation was less than average and therefore it was meaningful to adjust plant population accordingly.

RECOMMENDATIONS & EQUIPMENT SOLUTIONS:

Optimum seeding rates may always need to be adjusted to account for changes in differences in soil texture and weather conditions. Soils with more clay will hold more water than soils with more sand. With the AGCO precision planter technology, you can easily adjust target plant population, and achieve it with very high level of accuracy.

PAYBACK

The increase in revenue for not applying a wrong seeding rate (difference of 5000 seed/ha) was \$84 due to yield reduction, and additional seed costs of \$6.7, resulting in a total revenue increase of \$90.7 per hectare.

Assumptions: Cost of seeds \$67/ha Price of maize - \$140/t