

Kenya Lower Western Fertilizer Use Optimizer: paper version, July 2023

The below assumes:

- Calibration measurement is with a 3.14 ml of soda bottle with lining that holds about 3.5 g DAP, NPK (17-17-17) and 2.2 g Urea (ii) Blue band (100g) tin (BB) holding 110g, NPK (17-17-17) and DAP, 70g Urea.
- It is assumed maize and sorghum are planted at 75 by 25 cm, banana at 3 m by 3 m; beans and groundnuts at 50 cm row spacing.
- It is assumed grain prices per kg (Ksh): 55 maize, 55 sorghum, 140 beans, 55 groundnut unshelled, 30 banana and 65 paddy rice. 50 kg of fertilizer use costs (Ksh): 8000 KCl; 6400 DAP; 5200 Urea; 6400 17-17-17.
- Application rates are in kg/ac. If any fertilizer rate application is less than 10 kg/acre it is not economical and should be converted to another fertilizer. WAP- weeks after planting. DAE- days after emergence.

Level 1 financial ability (< 3500 KSh/ac available)

- Banana:** At the start of the rainy season, apply 60 kg 17:17:17 (1 BB per plant).
- Rice,** broadcast in 3 m band: at transplanting broadcast 14 kg DAP (1 BB for 13 m). Side dress 25 kg urea (1 BB for 4.7 m) at panicle initiation ((45-50 DAE)
- Maize:** Point apply 12 kg DAP at planting (1 bottle cap for 6 plants); sidedress with 12 kg Urea (1 top for 4 plants) at 6 WAP.
- Maize-bean intercrop:** at planting, point apply 14 kg DAP (1 top for 5 holes). Side dress with 15 kg urea (1 top for 3 plants) at 6 WAP.

Level 2 financial ability (3500-7000/ac KSh) available; some application at level 1

- Banana:** At the start of the rainy season, apply 88 kg 17-17-17 (0.7 BB per plant).
- Maize:** at planting, point apply 44 kg DAP (1 top for 1,7 holes). Side dress 18 kg urea (1 top for 2.6 plants) at 6 WAP.
- Sorghum:** at planting, band 20 kg DAP (1 top for 0.9 m). Sidedress 10 kg urea (1 top for 1.2 m).
- Rice,** broadcast in 3 m band: at transplanting broadcast 29 kg DAP (1 BB for 6 m). Side dress by broadcasting 48 kg urea at (7-14 DAE) (1 BB for 4 m) and 28 kg Urea (1 BB for 4 m) at panicle initiation (45-50 DAE)
- Bean:** at planting, band 10 kg urea (1 top for 1.8 m), 17 kg DAP (1 top for 1.6 m) and 12 kg KCl (.);
- Maize-bean intercrop:** at planting, point apply 31 kg DAP (1 top for 2.4 plants) and 16 kg KCl (1 top for 4.6 plants). Side dress with 27 kg urea (1 tops for 2 plants) at 6 WAP.

Level 3 financial ability (maximize profit per acre) (>7000 KSh/ac available); some application at level 2

- Banana:** At planting or at the start of the rainy season annually, apply 112 kg 17-17-17 (2 BB per plant).
- Maize:** at planting, point apply 72 kg DAP (1 top per hole) and 11 kg KCl (1 top for 7 plants). Side dress with 24 kg urea (1 top for 2 plants) at 6 WAP.
- Sorghum:** at planting, band 26 kg DAP (1 top per m). Side dress by banding 13 kg urea (1 top for 1 m) at panicle initiation.
- Rice,** broadcast in 3 m band: at transplanting 42 kg DAP (1 BB for 6 m) and 19 kg KCl (1 BB per 9.7 m). Side dress by broadcasting 25 kg urea at 14 DAE (1 BB for 4.7 m) and 42 kg Urea (1 BB for 2.8 m) at panicle initiation (45-50 DAE)
- Beans:** at planting, band 27 kg DAP (1 top for 1.6 m), 12 kg Urea (1 top for 1.5 m), and 18 kg KCl (1 top for 1.3 plants).
- Groundnuts:** at planting, band 18 kg DAP (1 top for 1 m) at flower initiation.
- Maize-bean intercrop:** at planting, point apply 45 kg DAP (1 top for 1.7 holes) and 21 kg KCl (1 top for 3.5 plants). Side dress with 37 kg urea (1 top for 1.3 plants) at 6 WAP.