**Kenya Lower Rift Valley Fertilizer Use Optimizer: paper version, 2016**

**The below assumes:**

Calibration measurement is with i) a 5 ml water bottle lid (lid) that holds about 3.5 g urea and 5.5 g DAP and MOP, ii) a 500 ml water bottle of 5 cm diameter cut to height of 4m has approx. 80 ml to hold 56 g urea, and 88 g DAP and MOP.It is assumed maize, Irish potatoes are planted at 75 cm row spacing, beans, soybean and green grams at 50 cm row spacing, wheat at 25cm row spacing.

* It is assumed grain prices per kg (Ksh): 25 maize, 50 soybean, 30 Irish potato, 60 beans, 30 wheat, 90 green gram.
* It is assumed 50 kg of fertilizer used costs (Ksh): 2850 urea; 3600 DAP; 3600 MOP, 3000 NPK23-23-0.
* Level 1 financial ability needs a benefit: cost ratio (BC) of 0.1-2; Level 2: BC **2 - 4**; Level 3: BC >4.
* 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.

**Level 1 financial ability**

* For maize HP (>3t), at planting band 12 kg DAP (1 lid for 1.4 m).
* For Irish potato, at planting band 56 kg DAP (1 lid for 0.4 m) and sidedress with 25 kg urea (1 lid for 0.5 m) at flowering.
* For greengram, at planting band 15 kg DAP (1 lid for 2.2 m).

**Level 2 financial ability**

* For maize HP (>3t), at planting band 31 kg DAP (1 lid for 0.8 m) and sidedress with 18 kg urea (1 lid for 0.75 m) at 6 WAP.
* For Irish potato, at planting band 61 kg DAP (1 lid for 0.3 m) and 30 kg NPK 23:23:0 (1 lid for 1.1m). Sidedress with 26 kg urea (1 lid for 0.5 m) at flowering.
* For beans, at planting band 13 kg DAP (1 lid for 2.5 m).
* For wheat, band at planting 17 kg DAP (1 lid for 4 m) and sidedress by banding 16 kg urea at panicle initiation (1 lid for 2.5 m).
* For greengram, at planting band 24 kg DAP (1 lid for 1.4 m).

**Level 3 financial ability (maximize profit per acre).**

* For maize HP (>3t), at planting band 48 kg DAP (1 lid for 0.5 m) and 15kg MOP (1 lid for 1.5 m) and sidedress with 37 kg urea (1 lid for 0.3 m) at 6 WAP.
* For Irish potato, at planting band 61 kg DAP (1 lid for 0.3 m) and 74 kg NPK 23:23:0 (1 lid for 0.4m) and sidedress with 19 kg urea (1 lid for 0.7 m) at flowering.
* For beans, at planting band 25 kg DAP (1 lid for 1.4 m).
* For wheat, band at planting 28 kg DAP (1 lid for 2.3 m) and sidedress by banding 29 kg urea at panicle initiation (1 lid for 1.4 m).
* For greengram, at planting band 33 kg DAP (1 lid for 1 m).