**Kenya Upper 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
* It is assumed maize and Irish potatoes are planted at 75 cm row spacing, green gram and beans at 50 cm row spacing, wheat at 25cm row spacing.
* It is assumed grain prices per kg (Ksh): 25 maize, 90 green gram, 30 wheat, 30 Irish potato and 60 beans
* It is assumed 50 kg of fertilizer used costs (Ksh): 2850 urea; 3600 DAP; 3600 MOP.
* 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 (>5T), at planting band 10 kg DAP (1 lid for 2.2 m) and sidedress by banding 17 kg urea 6 WAP (1 lid for 0.8 m).
* For Irish potato, at planting band 23 kg DAP (1 lid for 1 m).
* For wheat band at planting 15 kg DAP (1 lid for 4.4 m) and sidedress by banding 11 kg urea at panicle initiation (1 lid for 3.7 m).
* For maize-bean intercropping, at planting band 16 kg DAP (1 lid for 1.4 m).
* For greengram, at planting band 20 kg DAP (1 lid for 1.4 m).

**Level 2 financial ability**

* For maize HP (>5T), band 22 kg DAP at planting (1 lid for 1.0 m) and sidedress by banding 18 kg urea at 6 WAP (1 lid for 0.8 m).
* For Irish potato, at planting band 58 kg DAP (1 lid for 0.4 m)
* For beans, at planting band 10 kg DAP (1 lid for 3.2 m)
* For wheat band at planting 21 kg DAP (1 lid for 3.2 m) and sidedress by banding 32 kg urea at panicle initiation (1 lid for 1.2 m).
* For maize-bean intercropping, band 28 kg DAP at planting (1 lid for 0.8 m) and sidedress by banding 23 kg urea at 6 WAP (1 lid for 0.6 m).
* For green gram, at planting band 30 kg DAP (1 lid for 0.8 m).

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

* For maize HP (>5T), band 40 kg DAP at planting (1 lid for 0.6 m) and sidedress by banding 19 kg urea at 6 WAP (1 lid for 0.7 m).
* For maize LP (<5T), sidedress by banding 12 kg urea at 6 WAP (1 lid for 1.2 m).
* For Irish potato band 101 kg DAP (1 lid for 0.2 m).
* For beans, band 12 kg DAP at planting (1 lid for 2.9 m).
* For wheat, band at planting 30 kg DAP (1 lid for 2.2 m) and sidedress by banding 61 kg urea at panicle initiation (1 lid for 0.6 m).
* For maize-bean intercropping, band 43 kg DAP at planting (1 lid for 0.6 m) and sidedress by banding 27 kg urea at 6 WAP (1 lid for 0.5 m).
* For greengram, at planting band 35 kg DAP (1 lid for 1.0 m).