



### Assumptions:

- **Measurement** is with a: 500ml Highland water bottle CAP that holds 6.7 ml, 4.7 g urea, and 7.4 g DAP, TSP, and KCl; 500ml Highland water (2-cm bottle) to hold 47 ml, 33 g urea and 52 g DAP, TSP, or KCl.
- **Planting** is with row spacing of: 20 cm for wheat and barley; 40 cm for faba bean; and 75 cm Irish potato.
- **Grain prices** per kg (Et Birr): 4 maize; 6 Barley; 12 Faba bean; and 8 Wheat.
- **Cost** 50 kg of fertilize costs (Et Birr): 700 urea; 750 TSP; 850 DAP and 1500 KCl.
- Fertilizer rate  $\geq 25$  kg/ha. Broadcast width 2m
- Level 1 financial ability need BC >4; Level BC 2-4; Level BC 0.1-2.

### Level 1 financial ability.

- Wheat HP: broadcast 51 kg/ha DAP (5.6 m per 2-cm bottle) at planting and top-dress 28 kg/ha urea (5.5 m per 2-cm bottle) at panicle initiation.
- Wheat LP: broadcast 31 kg/ha urea (5 m per 2-cm bottle) after 2 weeks of emergence.
- Barley: broadcast 28 kg/ha DAP (8.1 m per 2-cm bottle) at planting.
- Faba Bean: band apply 40 kg/ha DAP (3.6 m per CAP) at planting.
- Irish potato: point apply 52 kg/ha DAP (1.8 plants per CAP & 75kg/ha urea, 0.75 point per CAP at planting and topdress 120kg/ha urea (0.5 point per CAP) at flower initiation

### Level 2 financial ability.

- Wheat HP: broadcast 74 kg/ha DAP (3.7 m per 2-cm bottle) at planting; top-dress 99 kg/ha urea (1.5 m per 2-cm bottle) at panicle initiation.
- Wheat LP: broadcast 92 DAP (2.6 m per 2-cm bottle) at planting and top-dress 95 kg/ha urea (1.6 m per 2-cm bottle) at panicle initiation
- Barley: broadcast 74 kg/ha DAP (3.4 m per 2-cm bottle) at planting.
- Faba Bean: band apply 66 kg/ha DAP (2.2 m per CAP) at planting.
- Irish potato: point apply 77 kg/ha DAP, 120 kg/ha urea (1.4 plants per CAP and 0.5 point per CAP respectively) at planting and topdress 168kg/ha urea, 0.75 CAP per plants at flower initiation.

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

- Wheat HP: broadcast 97 kg/ha DAP (2.6 m per 2-cm bottle) at planting and top-dress 167 kg/ha urea (1 m per 2-cm bottle).
- Wheat LP: broadcast 167 kg/ha DAP (1.6 m per 2-cm bottle) at planting and top-dress 135 kg/ha urea (1.2 m per 2-cm bottle)
- Barley: broadcast 111 kg/ha DAP (2.2 m per 2-cm bottle) at planting and top-dress 69 kg/ha urea (2.2 m per 2-cm bottle).
- Faba Bean: band apply 96 kg/ha DAP (1.1 m per CAP) at planting.
- Irish potato: point apply 101.2 kg/ha DAP 91 plant per CAP, 150 kg/ha urea (0.5 plants per CAP) at planting, and topdress 210 kg/ha urea (0.75 CAP per plant) at flower initiation