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Double cropping is one of cropping system intensification options for improving food security although it is rarely practiced due to rainfall amount and distribution stresses, and lack of right combination of crops in the bimodal rainfall areas of Ethiopian highlands. On the other hand, there is a pressing need to produce malt barley twice a year through double cropping. Therefore, this study compared lentil, potato, malt barley, and field pea (each receiving recommended N-P fertilizer rate) planted in Belg season as main plots, followed by planting of malt barley in Meher season in four sub plots receiving four nitrogen fertilizer levels (0, 18, 36 and 54 Kg N ha⁻¹). These treatments were laid out in a split plot of RCBD, replicated four times in 2012 and 2013 at Ankober. The results showed that double cropping of potato in Belg season (giving marketable tuber yield of 18.75-27.08 t ha⁻¹) with malt barley in Meher season (giving grain yield of 2,516 Kg ha⁻¹) significantly improved malt barley and system productivity. Production of malt barley in Meher season following malt barley in Belg season gave the lowest grain yield of 1,123 Kg ha⁻¹. Yield of Meher season malt barley increased with increasing N rates tested. The results suggest that potato production in Belg season fits well with malt barley production in Meher season with the application of N rates as high as 54 Kg N ha⁻¹ to improve production and food security through double cropping in the bimodal rainfall highlands of Ethiopia. However, optimum N rate that does not compromise malt barley grain quality should be determined for this double cropping system. The observed failure of malt barley production in Belg season implies twice malt barley production in Belg and Meher seasons per year in the double cropping system is not feasible.

Bimodal rainfall, double cropping, field pea, lentil, malt barley, nitrogen fertilizer, potato

Belg

Triticum spp
Meher

Hordeum vulgare

Belg *Meher*

Meher

Belg *Meher*

Meher

Belg

Belg

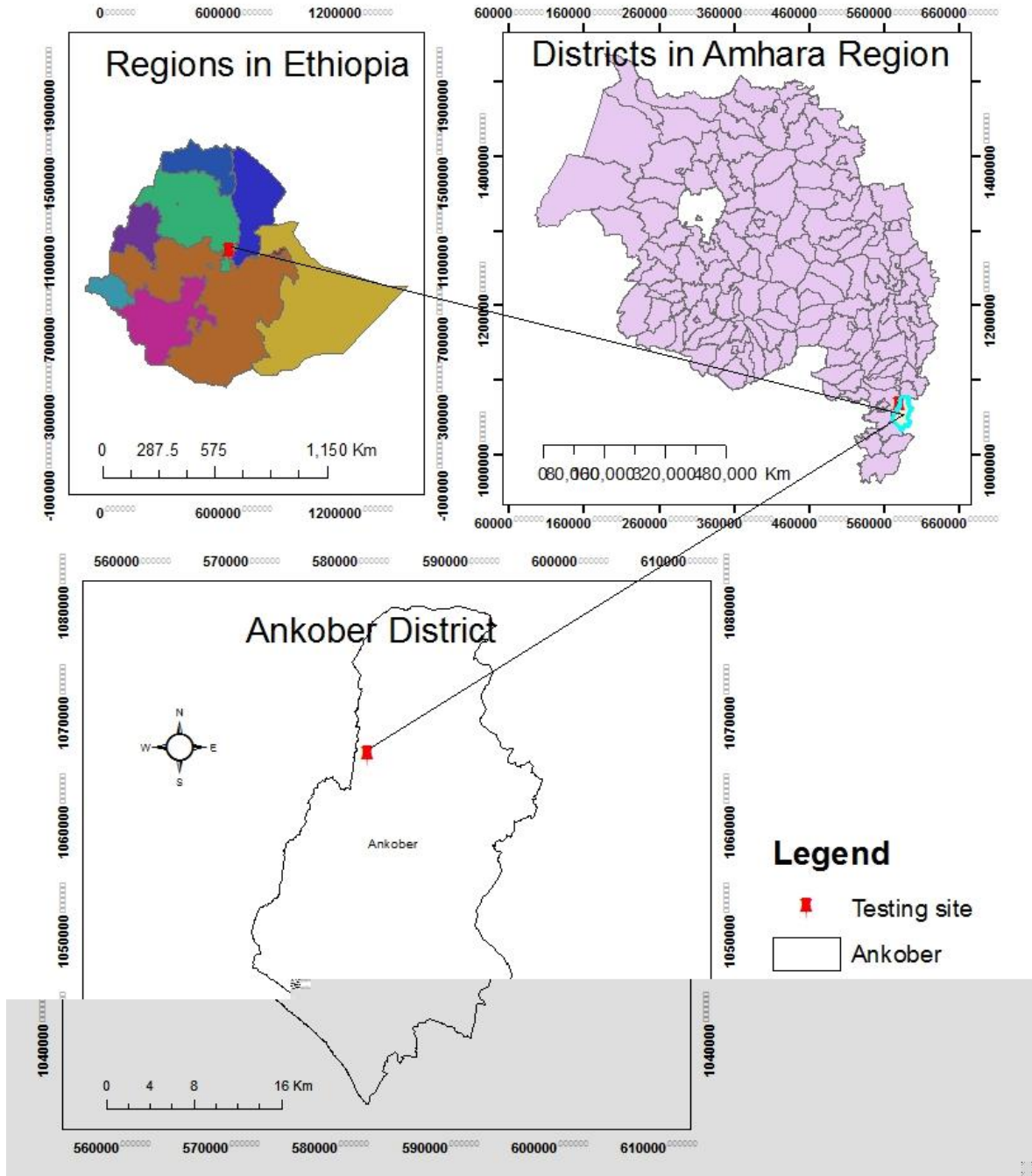
Belg

Meher

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Belg *Meher*



Meher

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Belg

Annual rainfall in 2012 was 809.2 mm

Annual rainfall in 2013 was 997.4 mm

Meher

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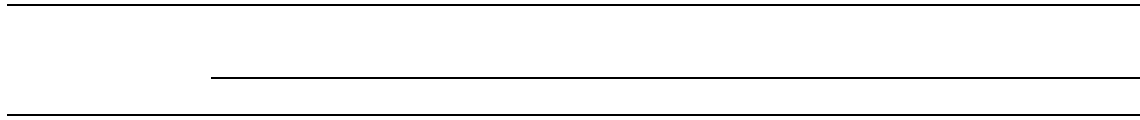
Belg

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Belg



**There was 35% seed loss caused by hail storm; #yield from field pea was well filled green pod harvest.*

Note: *Statistical comparison of precursor crops within Belg season across years was not possible because of total failure of lentil and field pea in 2012; and hail damage on malt barley in 2013.*

Meher

Meher

Belg

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Belg

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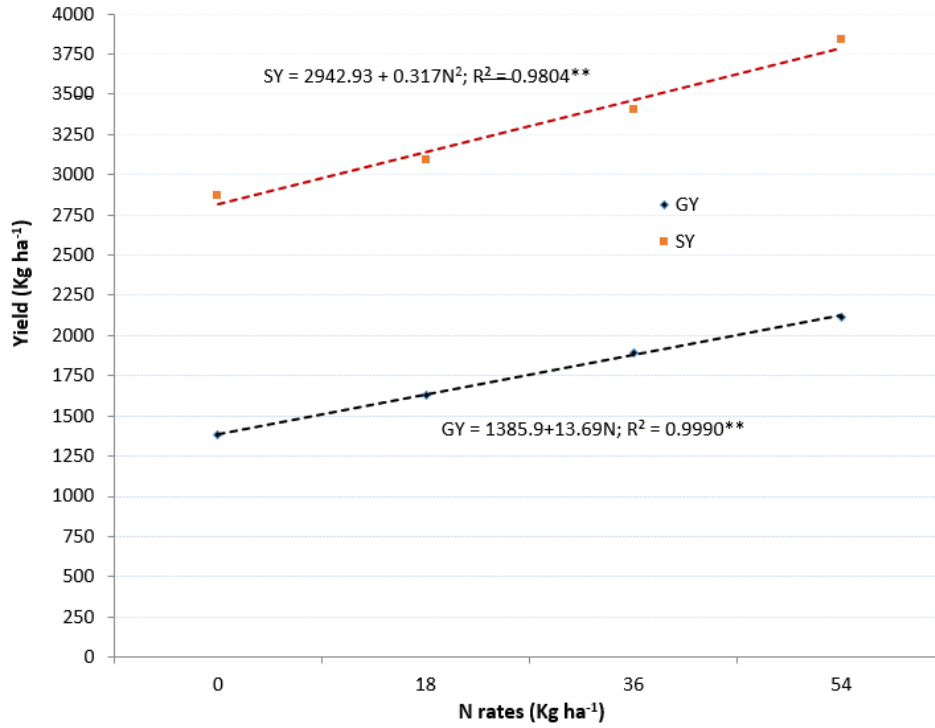
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Meher

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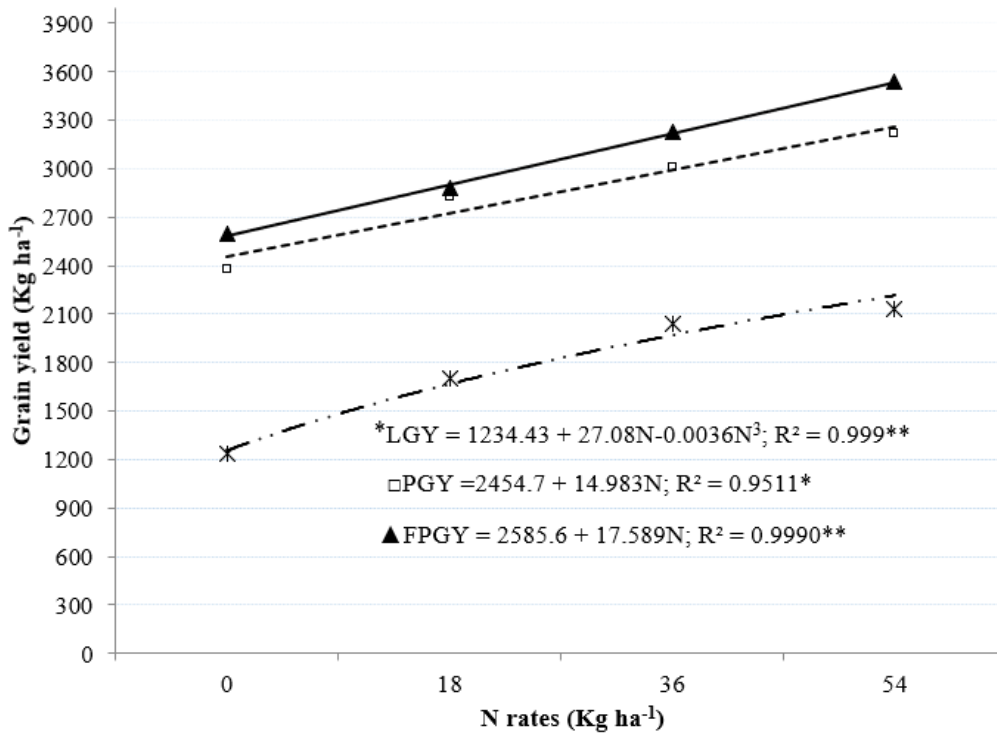
Meher

Meher



Meher
 **Significant at <0.01

probability level; GY: grain yield; SY: straw yield



LGY: grain yield of malt barley following lentil precursor; PGY: grain yield of malt barley following potato precursor; FPGY: grain yield of malt barley following field pea precursor

Meher

Belg

Meher

Belg
Meher

Belg

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