

Africa RISING in the Ethiopian Highlands

Conservation agriculture/farmers mechanization: Africa RISING science, innovations and technologies with scaling potential from the Ethiopian Highlands

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Key messages

- Yield improving technologies are well known (e.g., row planting, timely weeding, micro-dosing), but their application generally increases the demand for farm power: human labor, draught animal power or engine power.
- However, farm power has increased very slowly in Ethiopia.
- Land preparation is one of the most critical operation, and one of the most power intensive.
- Zero-tillage (i.e., direct seeding without prior land preparation) allows for quick crop establishment and makes the use of low powered, affordable, and easy to maintain two-wheel tractors.
- Two-wheel tractors are multipurpose sources of power and can be used for operations such as transport, threshing and water pumping.

Objectives and approach

- Most Ethiopian farmers are capital constrained and unable to purchase two-wheel tractors individually: they could nevertheless access mechanization through services provided by rural entrepreneurs, backed by an available and strong aftersales nearby.
- In addition, it is not profitable for farmers to own machines unless they provide services.

Key results

- The time necessary to establish a wheat crop is more than 10 times lower
- Wheat grain yield is increased by more than 2 tons per ha
- The profitability of service provision increases with multipurpose use of the tractors (e.g., seeding + transport + threshing + water pump), which increases tractor use rates.

Significance and scaling potential

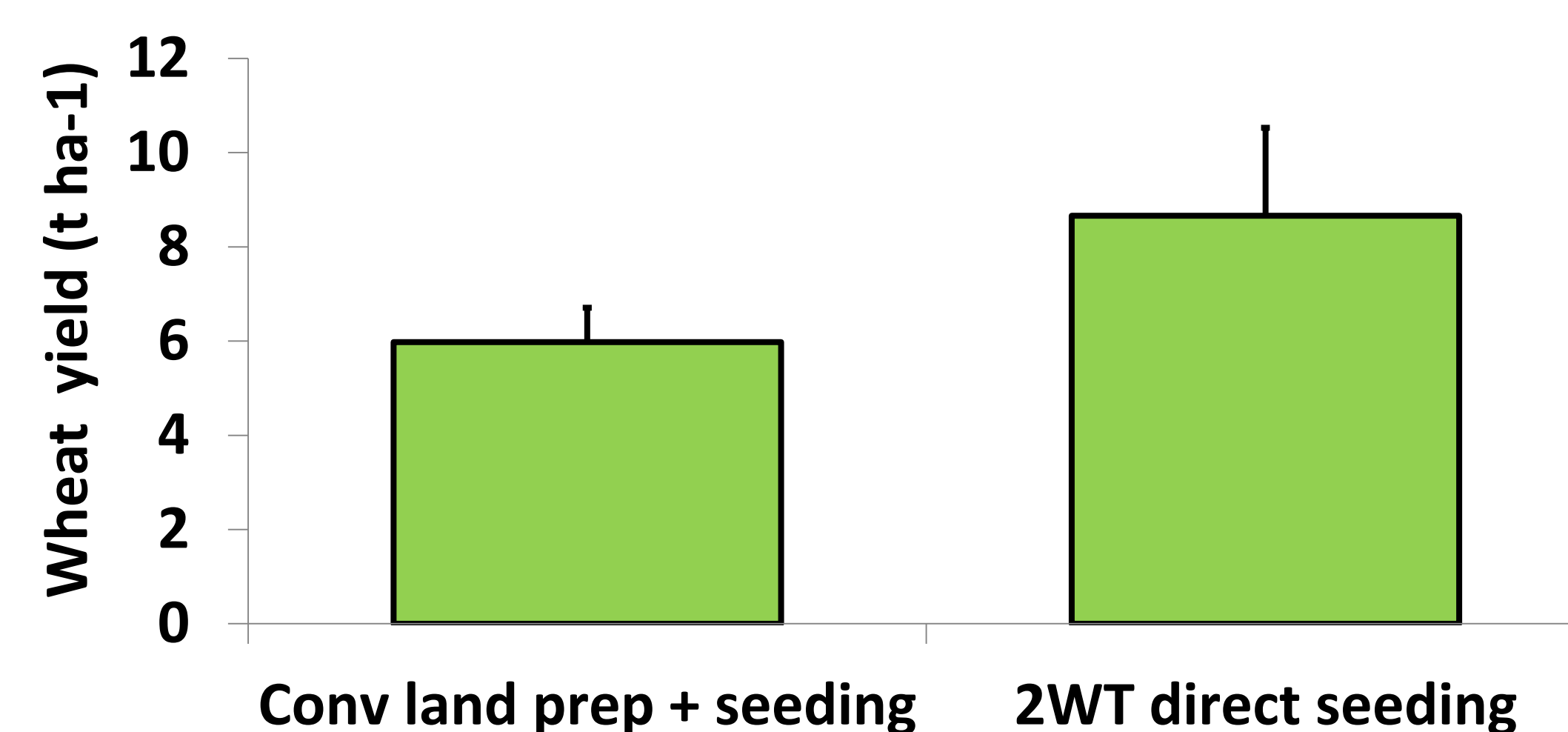
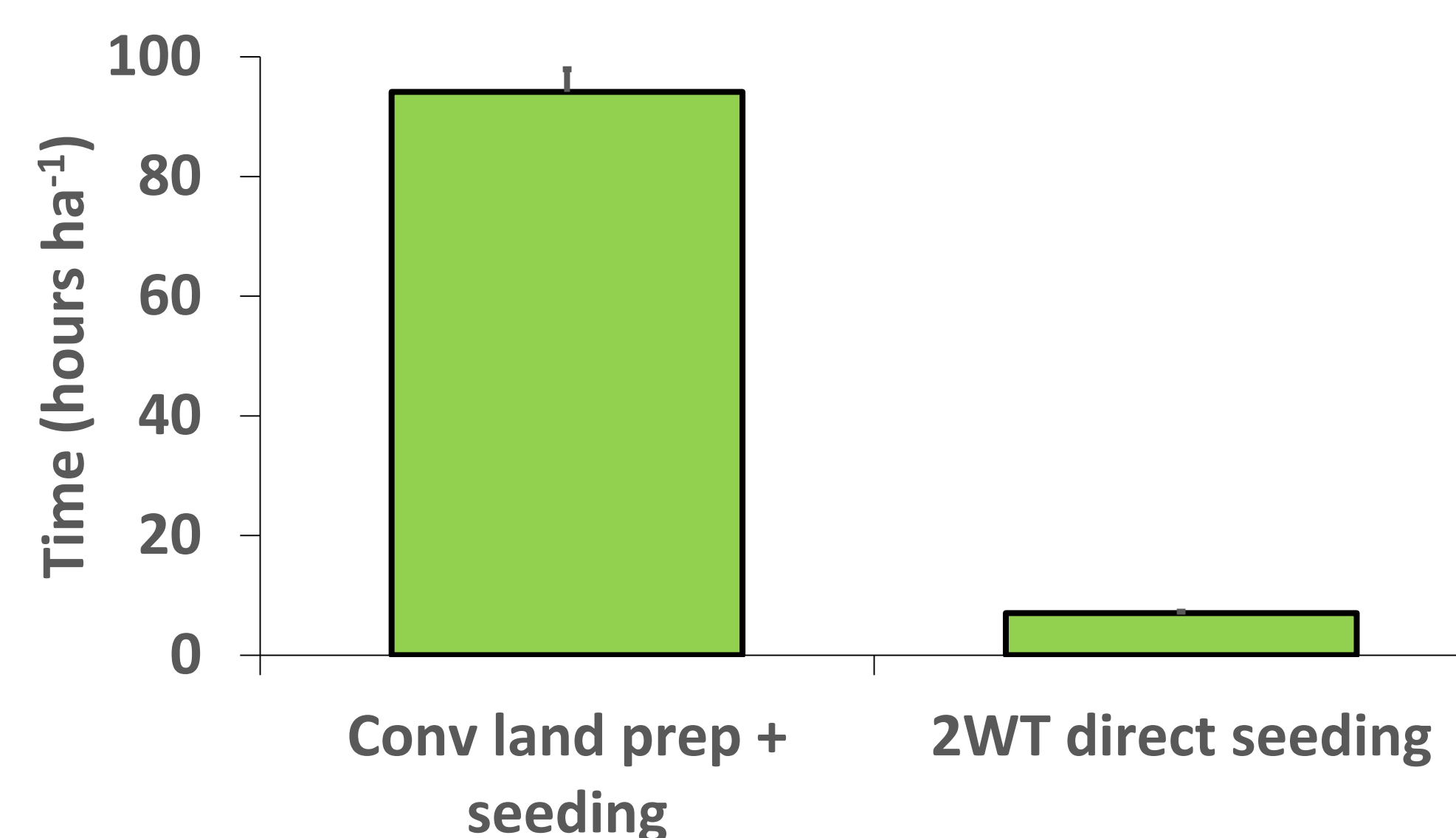
- Two wheel tractor based planting increases precision at sowing, increases crop yields, and hence contribute significantly towards ensuring household food security
- Drudgery is reduced and, time and labour are saved on the smallholder farm
- Two wheel tractor based technologies generate income through service provision and create employment in rural communities
- Each 2 wheel tractor can provide services to more than 200 households per year



Biomass shortages, diseases and droughts are challenging the use of oxen in many parts of Ethiopia. Agriculture in the country is dominated by labor-intensive operations.



Our approach to appropriate mechanization summarized in one picture: a direct seeder powered by a locally available two-wheel tractor (2WT) operated by a rural service provider receiving continuous training.



Comparison of the performance of wheat established conventionally (maresha ploughing, manual seeding and broadcasting of fertilizer) and established through direct seeding with a two-wheel tractor (2WT).

Core partners



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