

INCREASING WHEAT PRODUCTION AND PRODUCTIVITY THROUGH SCIENCE-BASED KNOWLEDGE AND INNOVATIONS FOR A COMPETITIVE WHEAT MANUFACTURING VALUE CHAIN IN UGANDA

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Introduction

Uganda's national annual wheat grain demand stands at 650,000 MT. Current production is 25,000 MT from 16,000ha mainly in the highlands meeting less than 10% of the national demand. Imports valued at \$450 million mainly from Russia, Argentina, Ukraine, Germany and Lithuania each shipping in grain worth \$41.9M, \$31.3M, \$15.1M, \$13.8M and \$4.83M, respectively. Introducing wheat in non-traditional areas, such as the mid and low altitude environments is the best alternative to cut on the huge imports. However, these areas are characterized by; heat and drought stress, wheat rust diseases (stem, leaf and yellow rust) and lack of varieties adapted to these environments. Therefore, there is urgent need for high yielding widely adapted wheat varieties that can perform well in the different environments. This study was carried out to;

- To fast-track development and release of widely adapted, industry preferred wheat varieties for a diversified agro industry in Uganda
- To strengthen access and utilization of quality wheat seed in Uganda

Materials and Methods

➤ Advance Yield Trials (AYTs) consisting of 19 best performing wheat lines were evaluated in 6 sites; Apac, Ngenge & Ikulwe – lowland, Bulegeni & Rwebitaba - mid; Kalengyere – high altitude



Fig.1 Planting of trials in Ngenge site

➤ Experiments laid in RCBD, plot sizes of 6 rows of 2.5m length and inter-row spacing of 0.3m for AYT and 10 rows of 5m length and inter-row spacing of 0.3m for NPT



Fig.2 Team collecting data at seedling in Ikulwe and at soft dough stage in Rwebitaba



Fig.3 Team making selections in the field



Fig.4 Harvesting of multiplication plots for seed

➤ National Performance Trials (NPTs) of 4 best performing candidate lines in terms of yield and adaptation were conducted in Ngenge, Ikulwe, Apac, Bulegeni, Rwebitaba, Namisindwa and Kalengyere

➤ Data collected on key agronomic traits, disease reaction and yield and analyzed using GenStat 14th edition



Fig.5 MAAIF crop inspectors calling DUS data

➤ Data for Distinctiveness Uniformity and Stability (DUS) was collected by MAAIF

Results

- The data revealed significant genotypic differences for all the parameters measured.
- Some lines yielded more than 6 t/ha in some sites (Fig. 1)
- Wheat lines performed differently in the different sites with the best site being Rwebitaba (average 5.4 t/ha) and the worst site was Ikulwe with average of 0.8t/ha (Table 1).
- 4 best performing lines with wide adaptability were selected for cultivation in the different agro ecologies

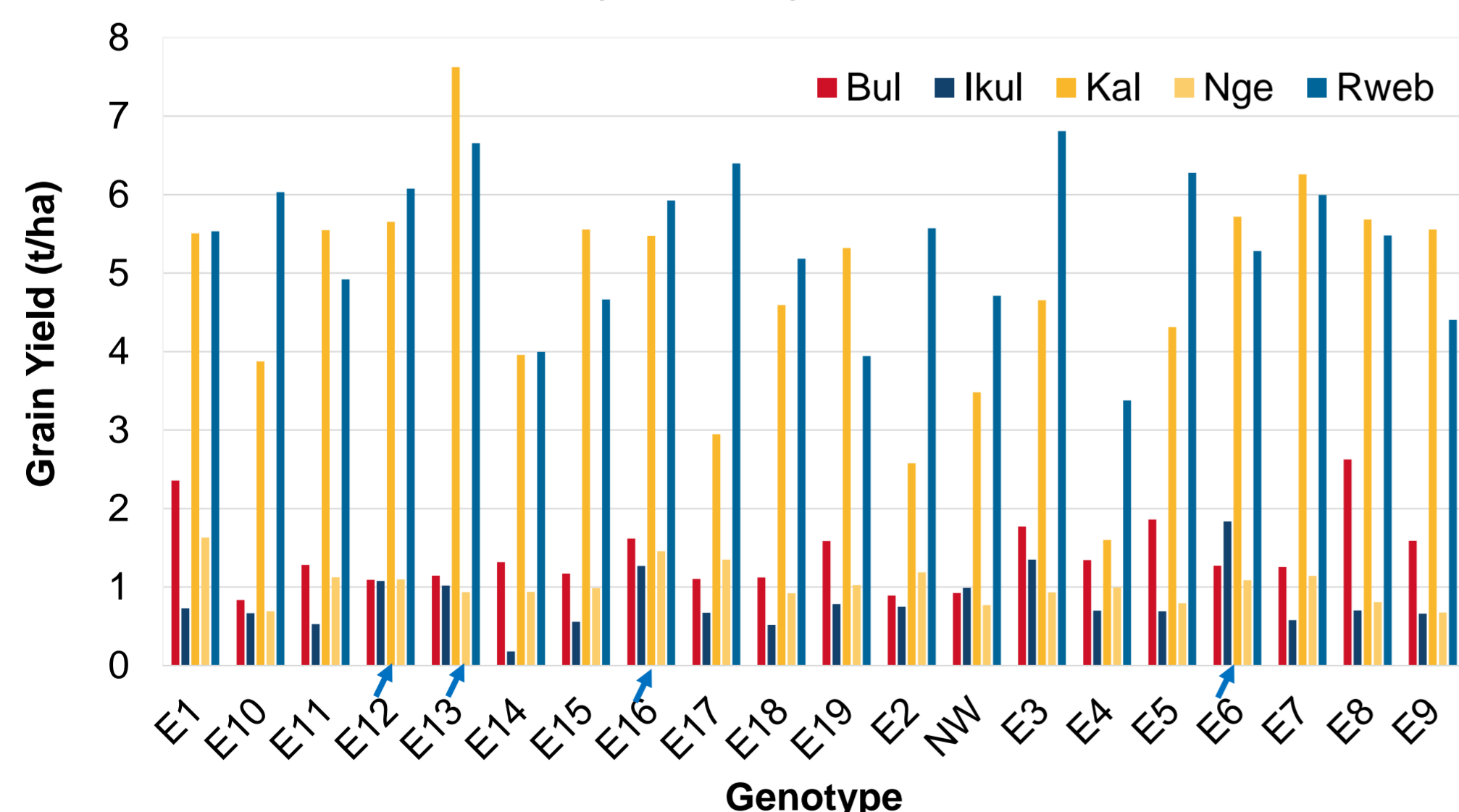


Fig. 1 Average Grain yield the different wheat lines in different sites

Table 1 Overall means of the different traits across the different sites

Trait	Bul	Ikul	Kal	Nge	Rweb	L.S.D
DF	61.97±0.694	52.28±0.44	68.18±0.478	67.92±0.602	68.08±0.674	0.928
Agro	3.717±0.091	3.7±0.145	4.45±0.122	3.817±0.129	4.633±0.068	0.2869
PH	62.79±612	56.22±0778	89.39±1.282	62.79±0.613	89.39±1.281	1.589
HL	9.1±0.147	9.6±0.159	10.2±0.186	9.1±0.147	15.7±5.567	6.93
GY	1.407±0104	0.812±0.081	4.794±0.314	1.027±0.055	5.361±0.213	0.4008

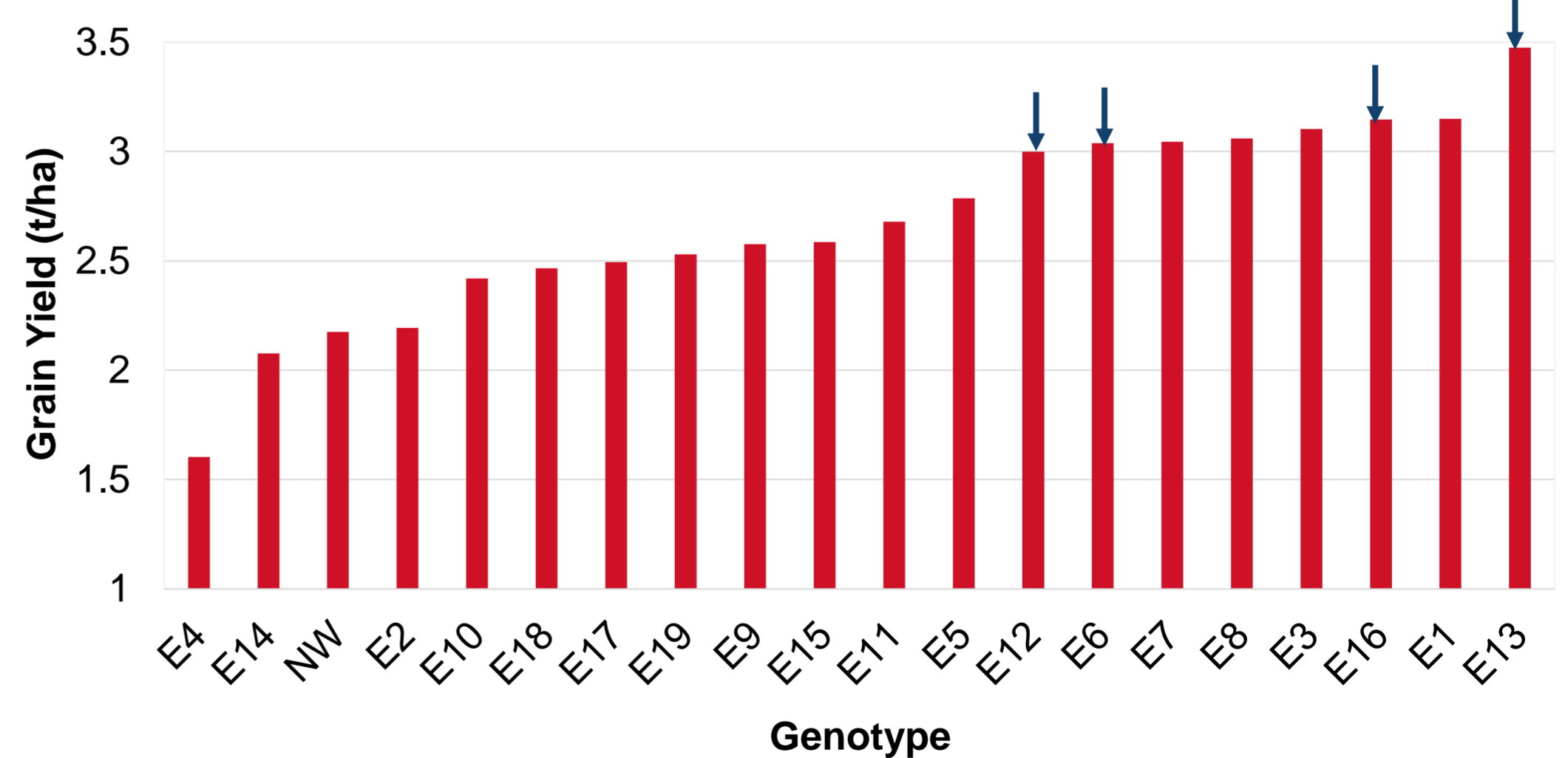


Fig. 2 Average total grain yield across sites for the 19 entries. The 4 promising lines (E6, E12, E13 E16) with stable yields across sites were advanced through the different breeding stages and submitted to MAAIF for release

Conclusions

- ❖ Four candidate wheat lines with grain yields above 5 t/ha in the highland and mid altitude areas and above 1.5 t/ha in the low altitude areas have been recommended for production in the different agro ecologies
- ❖ 1.2 tons of elite seed of Narrowheat 1, 2 and 3 was bulked and availed for uptake and 0.5 tons of pipeline materials bulked
- ❖ There is need for accelerated promotion and scaling up of adapted wheat varieties through on-farm demos and mass seed production