

Evaluation of yield and quality of short season flue cured tobacco hybrids in Zimbabwe: AP32

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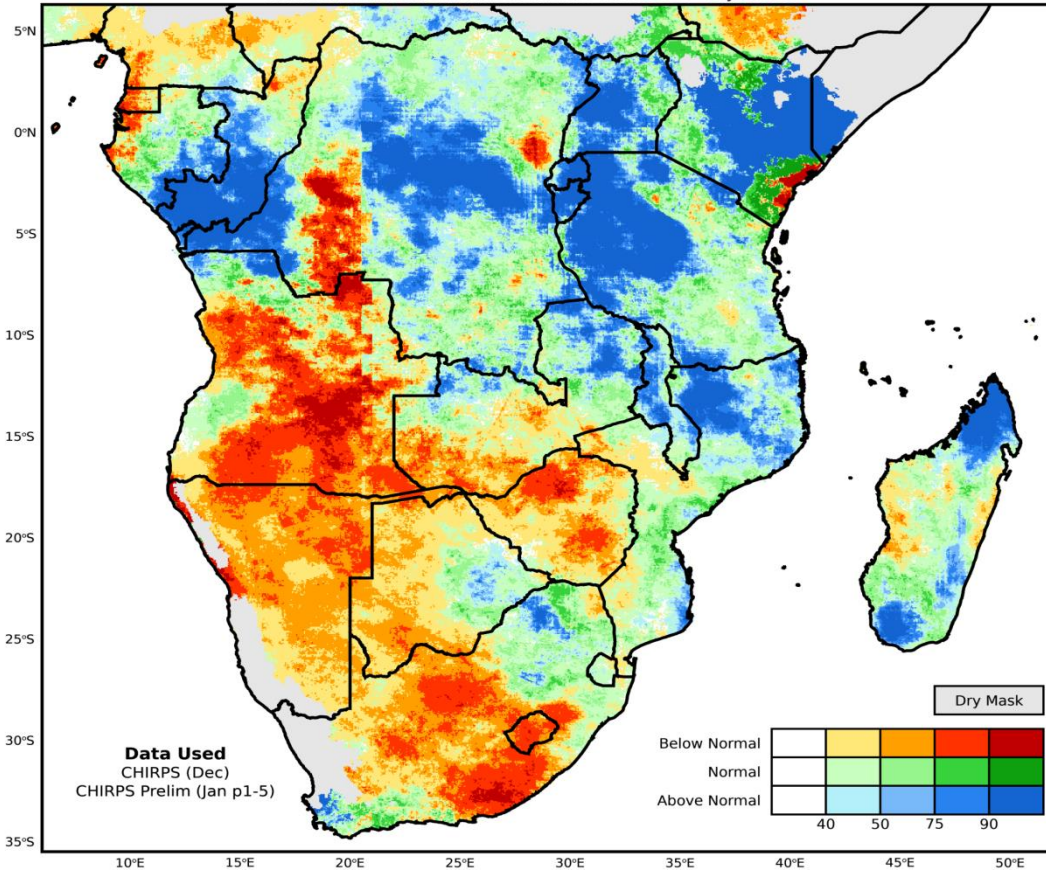
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Outline

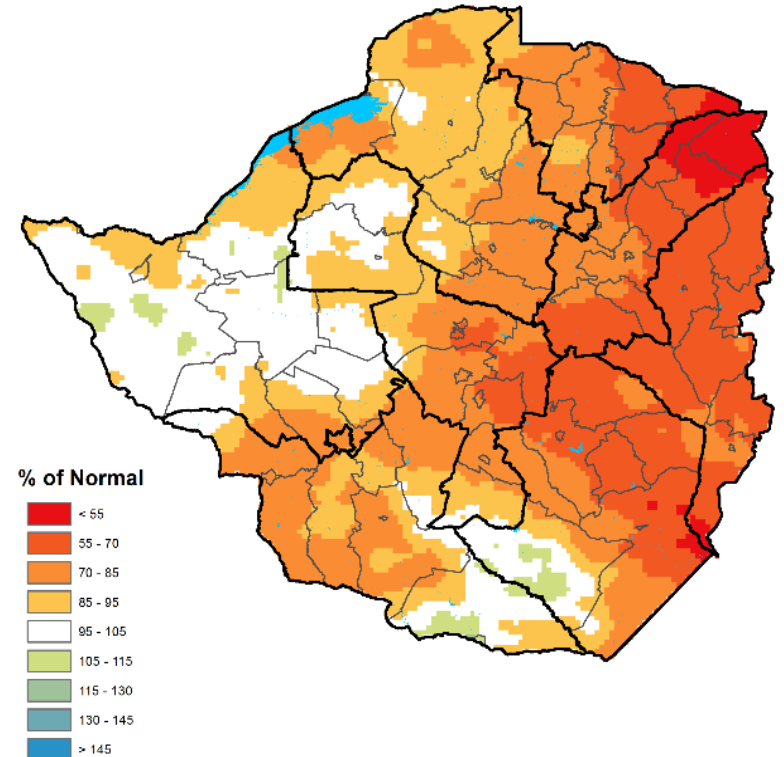
- **Background**
- **Materials and Methods**
- **Results**
- **Conclusion**
- **Acknowledgements**

Background

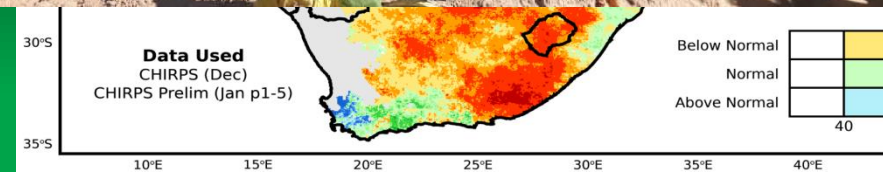
SPP Probability (%) for the period: 01Dec2018 - 28Feb2019
Based on CHIRPS Accumulative Rainfall: 01Dec2018 - 25Jan2019



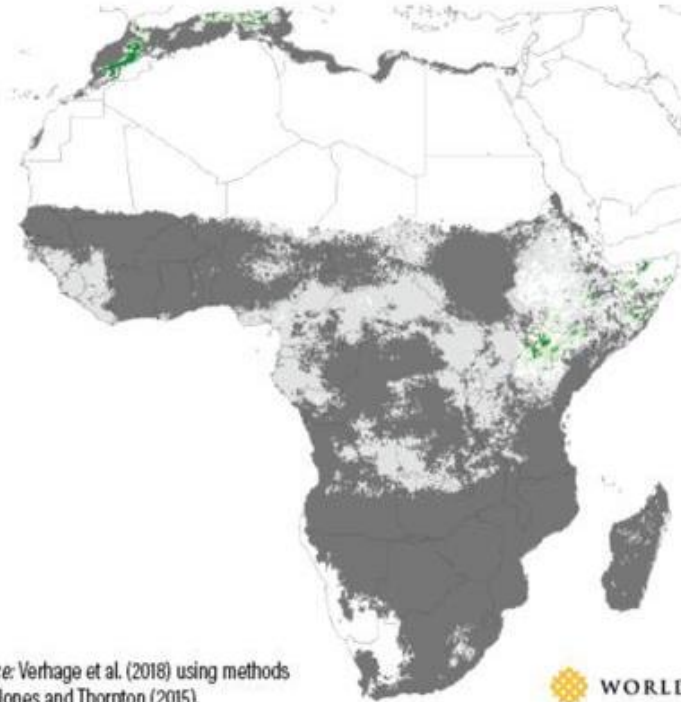
Zimbabwe
Percent Anomaly (Oct - Jan 31)
(2018 Cumulative Rainfall) / (Avg. Cumulative Rainfall 1982 - 2011) x 100



Background



Climate change could shorten growing seasons in much of sub-Saharan Africa by more than 20 percent by 2100



Source: Verhage et al. (2018) using methods from Jones and Thornton (2015).

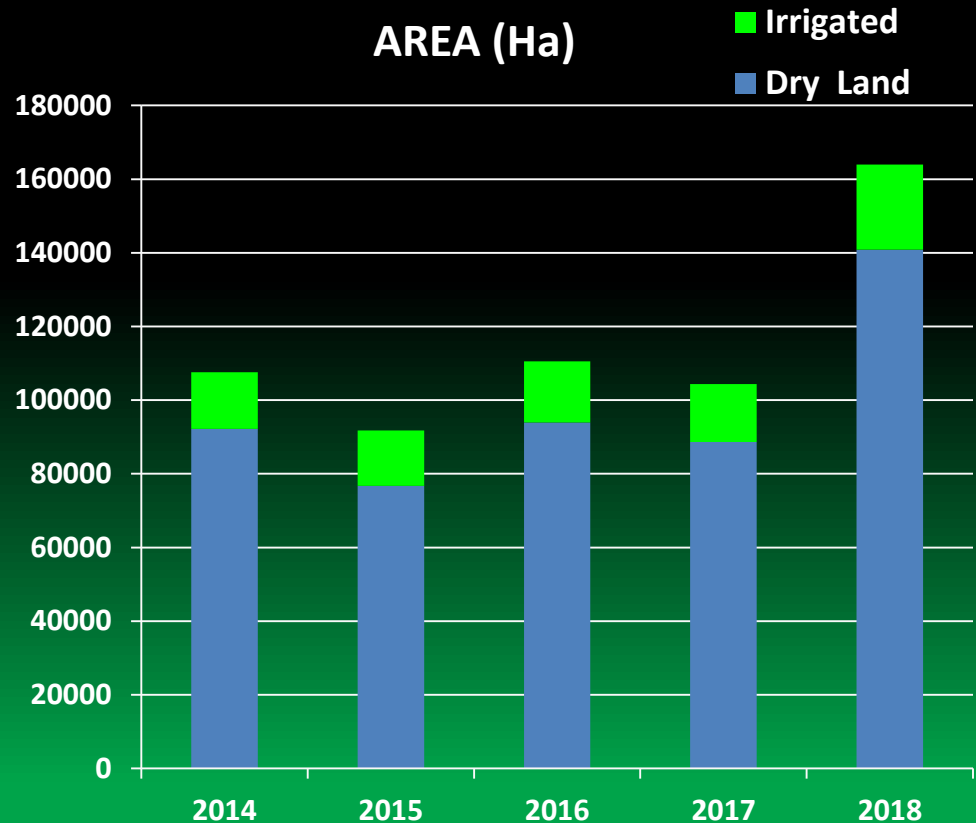
Coupled to this...

- Increasing tobacco base – 155 000 growers – mostly small scale
- Most in non traditional and marginal regions
- Resource limited – irrigation, chemicals



Typical small scale farmer

- Cannot irrigate
- Yields approximately 1.5 T/ha
- Typically applies lower than standard fertilizer and chemicals



The short season variety ideotype

- Fast growing – escape drought
- Acceptable yield - >2.5 t/Ha
- Acceptable quality
- Tolerant to common biotic stresses (TMV, RKN)



Aim/Objective

- To evaluate for material with acceptable yield and quality adapted to short season environments

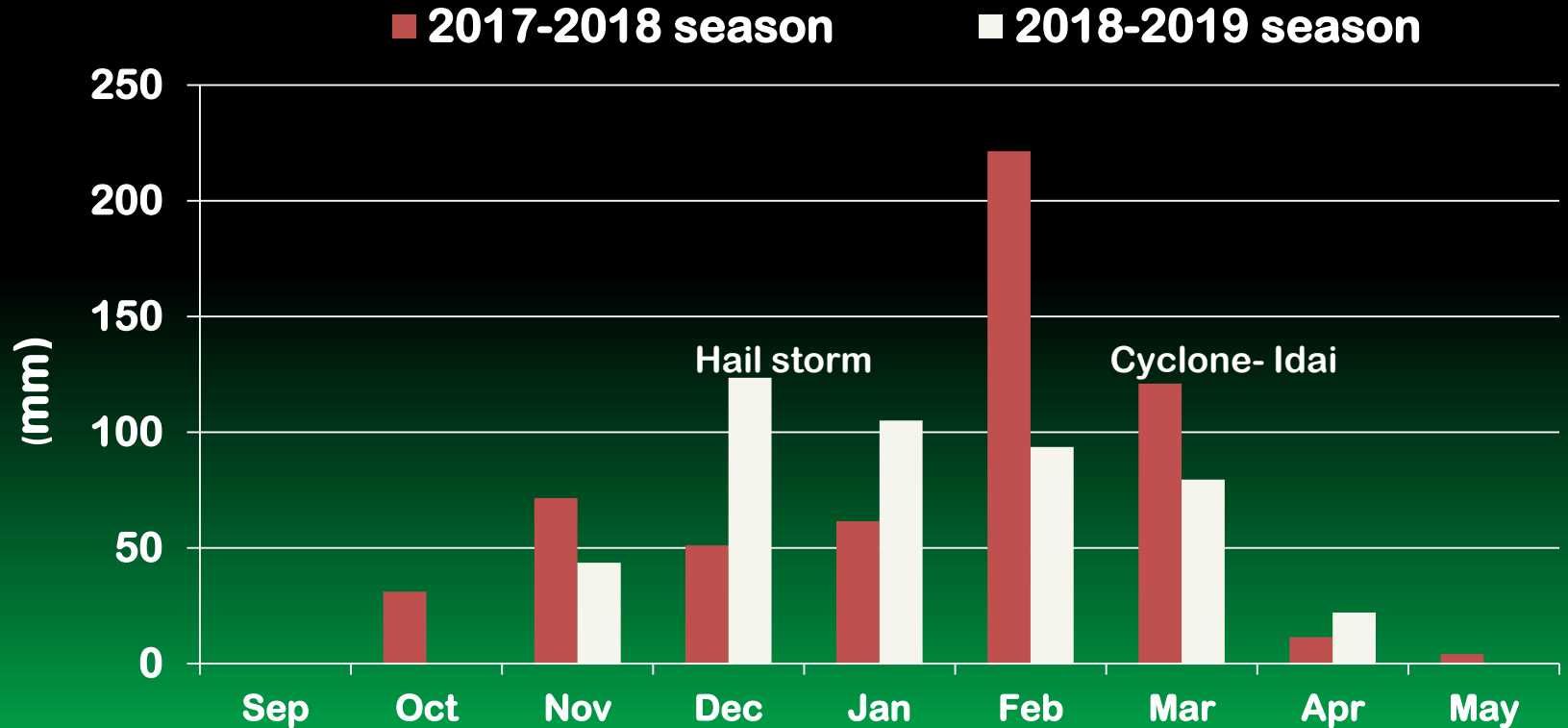
Materials and Methods

Experimental Site

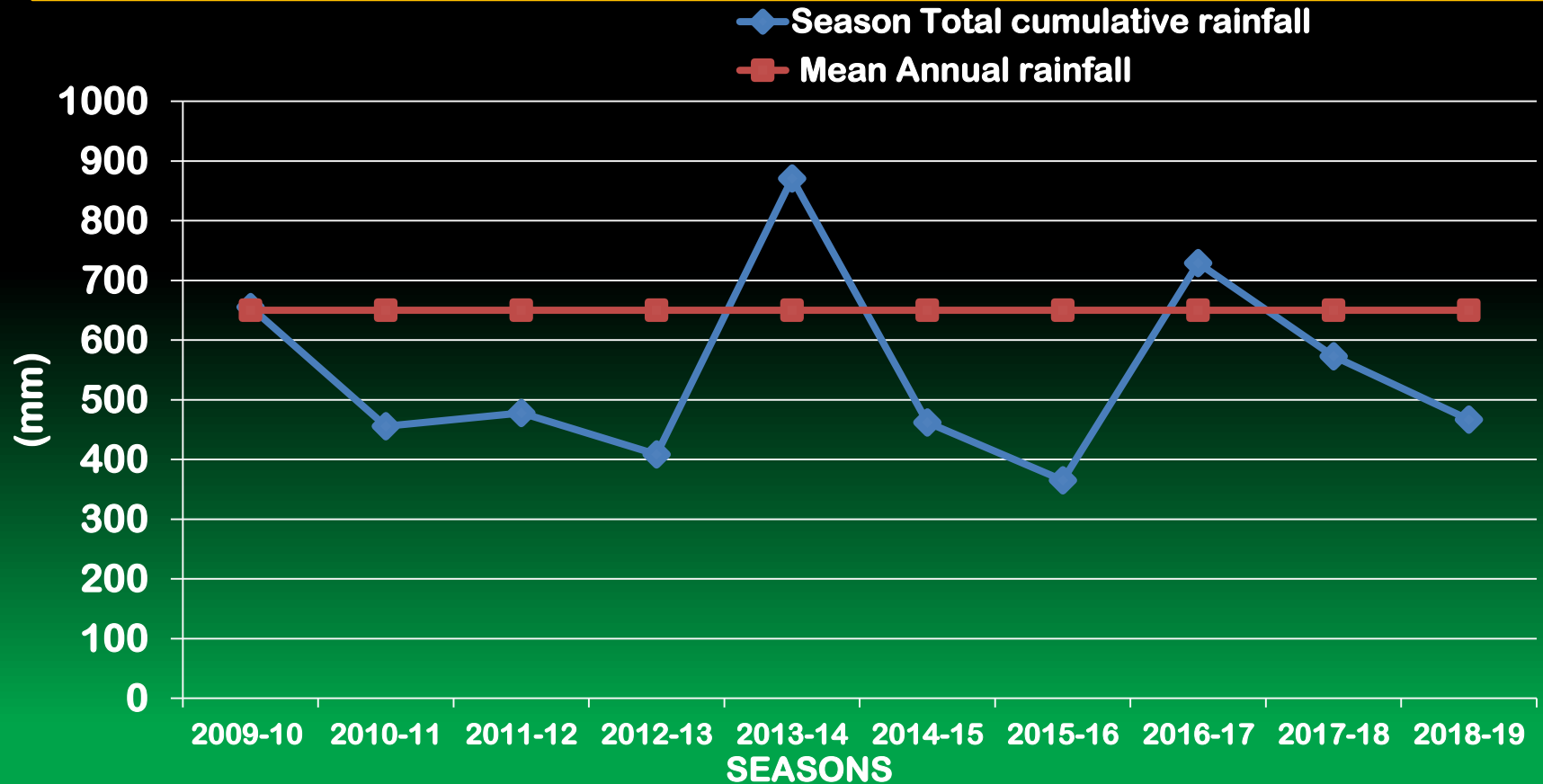
- Masvingo Research Station
- Typical Marginal environment



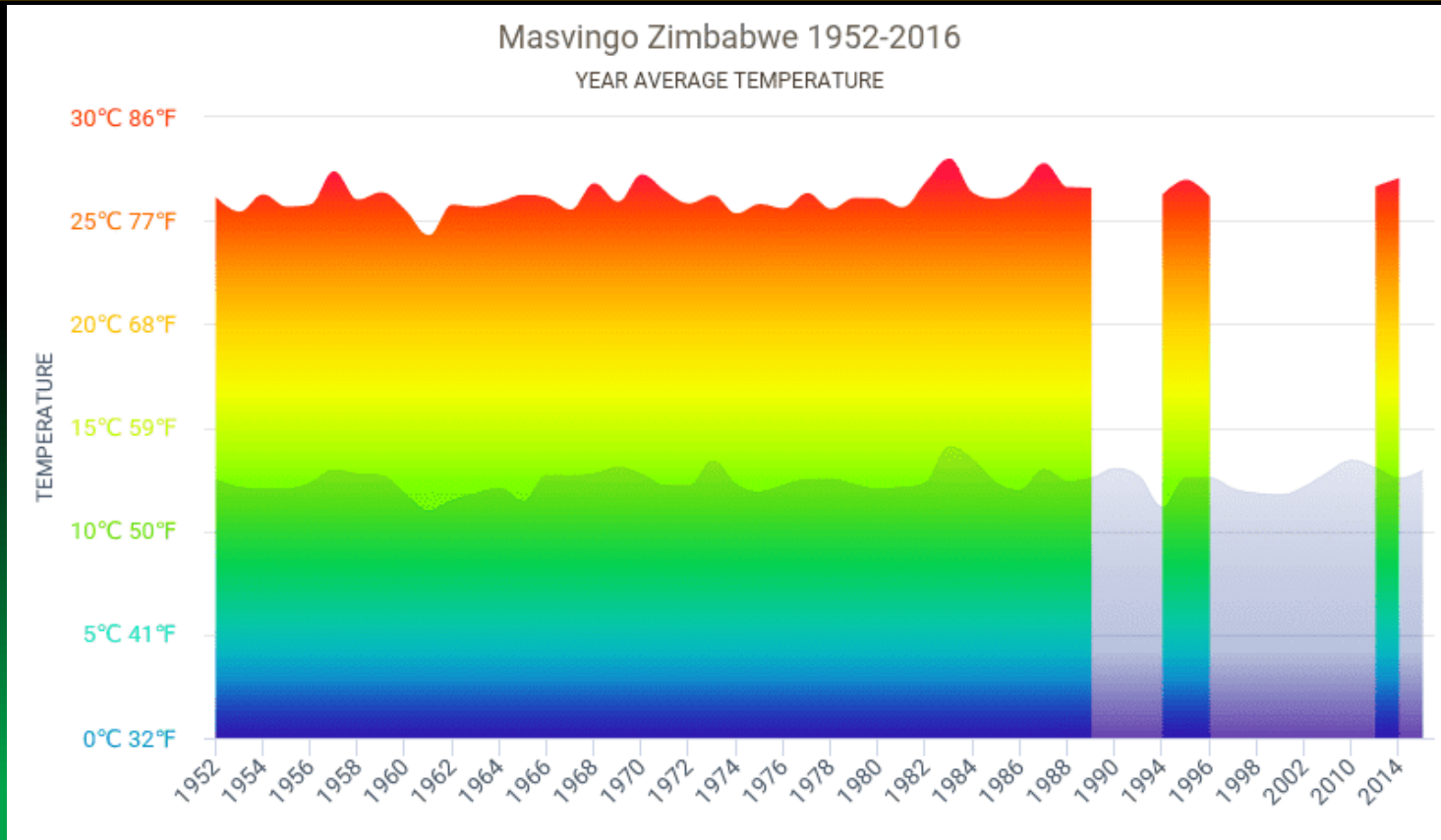
Experimental site rainfall distribution



Experimental site rainfall pattern



Experimental site avg. temperature



Design

- Experimental design
 - ✓ Randomized Complete Block Design (RCBD) with 18 treatments in 3 blocks



Treatments

1. ETH 01/17
2. ETH 02/17
3. ETH 03/17
4. ETH 04/17
5. ETH 05/17
6. ETH 06/17
7. ETH 07/17
8. ETH 08/17
9. ETH 09/17
10. ETH 10/17
11. ETH 11/17
12. ETH 12/17
13. KRK 66 (YIELD CONTROL)
14. KRK 26R (QLTY CONTROL)
15. K RK70
16. K RK73
17. T 68
18. T 69

Nutrition and fumigation

- Fumigation with EDB prior to planting was done at 12 L/Ha
- 750 Kg/Ha of 5:15:12 fertilizer was applied (37.5 units of Nitrogen(N);112.5 Units of Phosphorus (P); 90 units of Potassium (K))
- 34.5 Units of N at 4 WAP and 10 Units of N at 8 WAP



Data collection

- Weekly Leaf expansion, plant height and stand counts
- Leaf scotch measurements
- Root knot galling
- Alternaria, TMV and leaf disease measurements
- Yield and Quality

Gall-rating scale

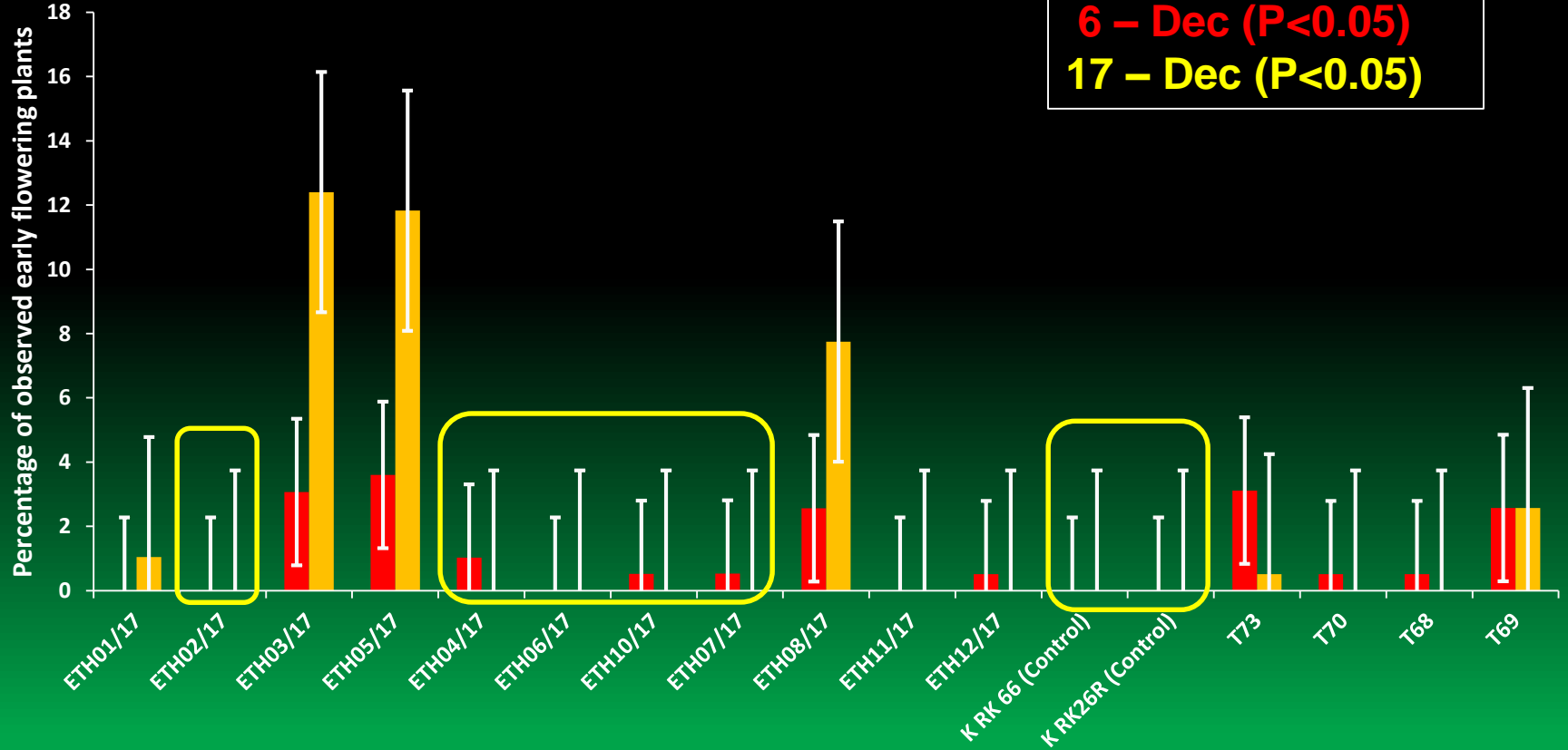


Gall-rating scale

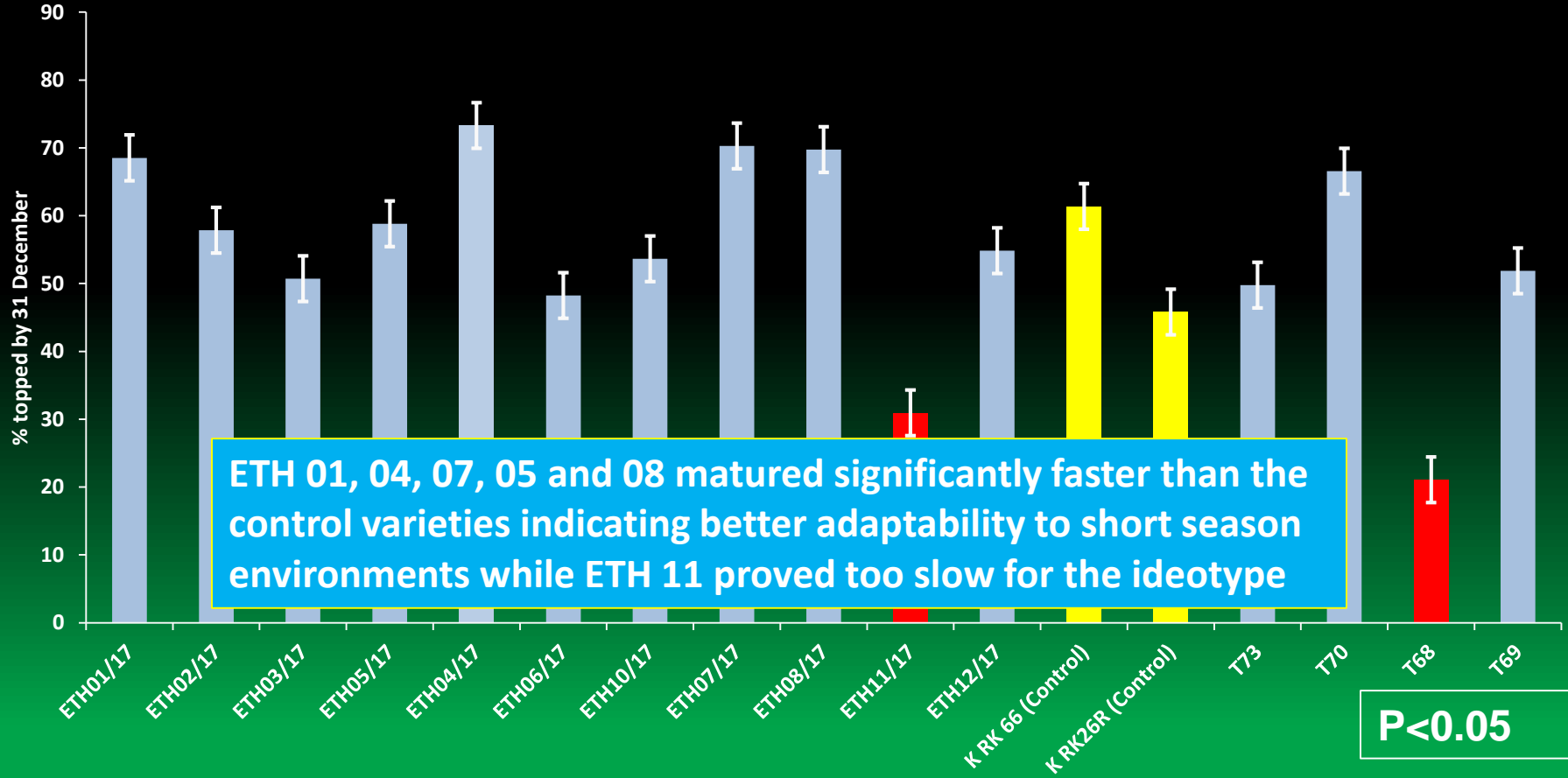


Results

Early flowering

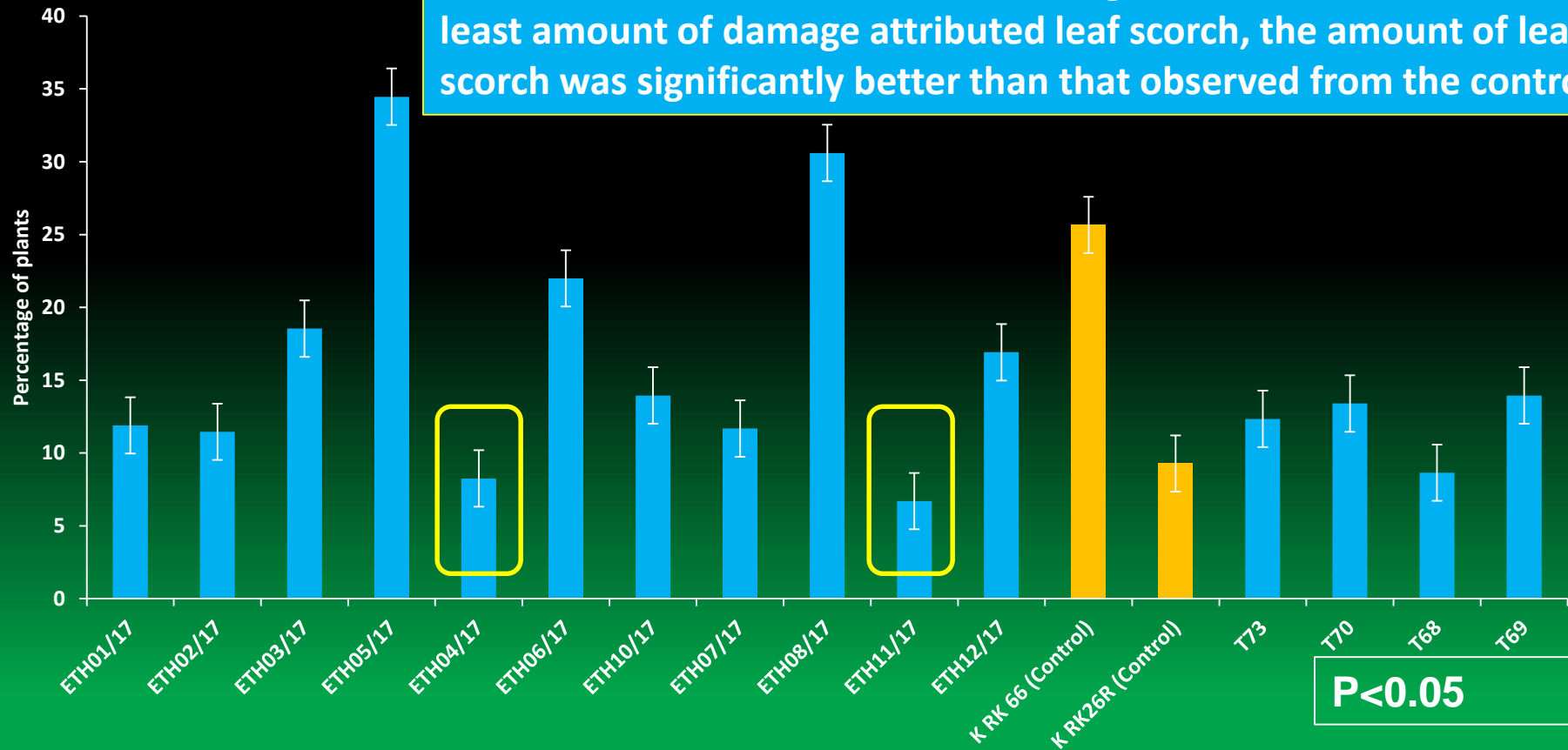


Time to Topping



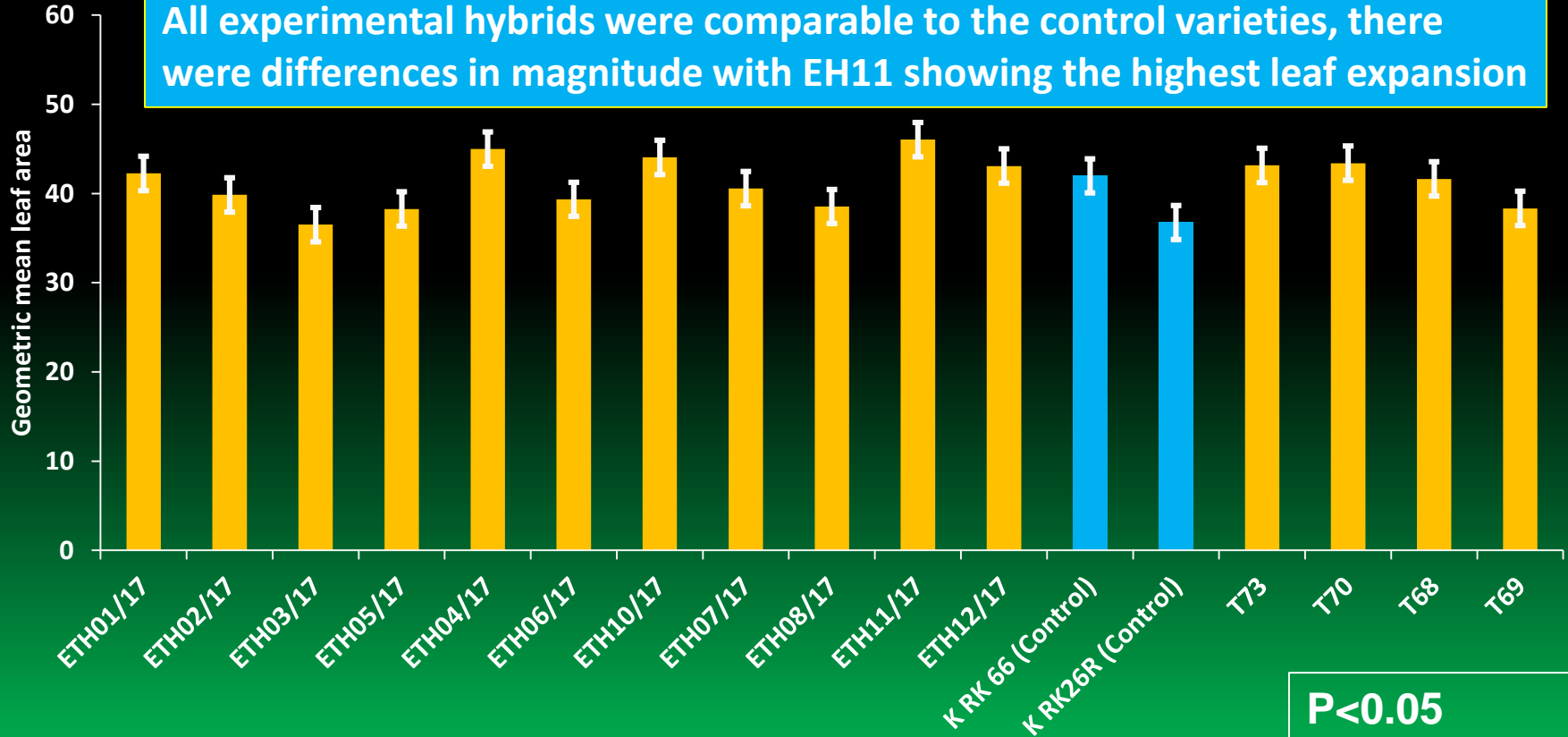
Leaf Scorch

ETH 04 and 11 faired better under marginal conditions with the least amount of damage attributed leaf scorch, the amount of leaf scorch was significantly better than that observed from the control



Leaf Expansion

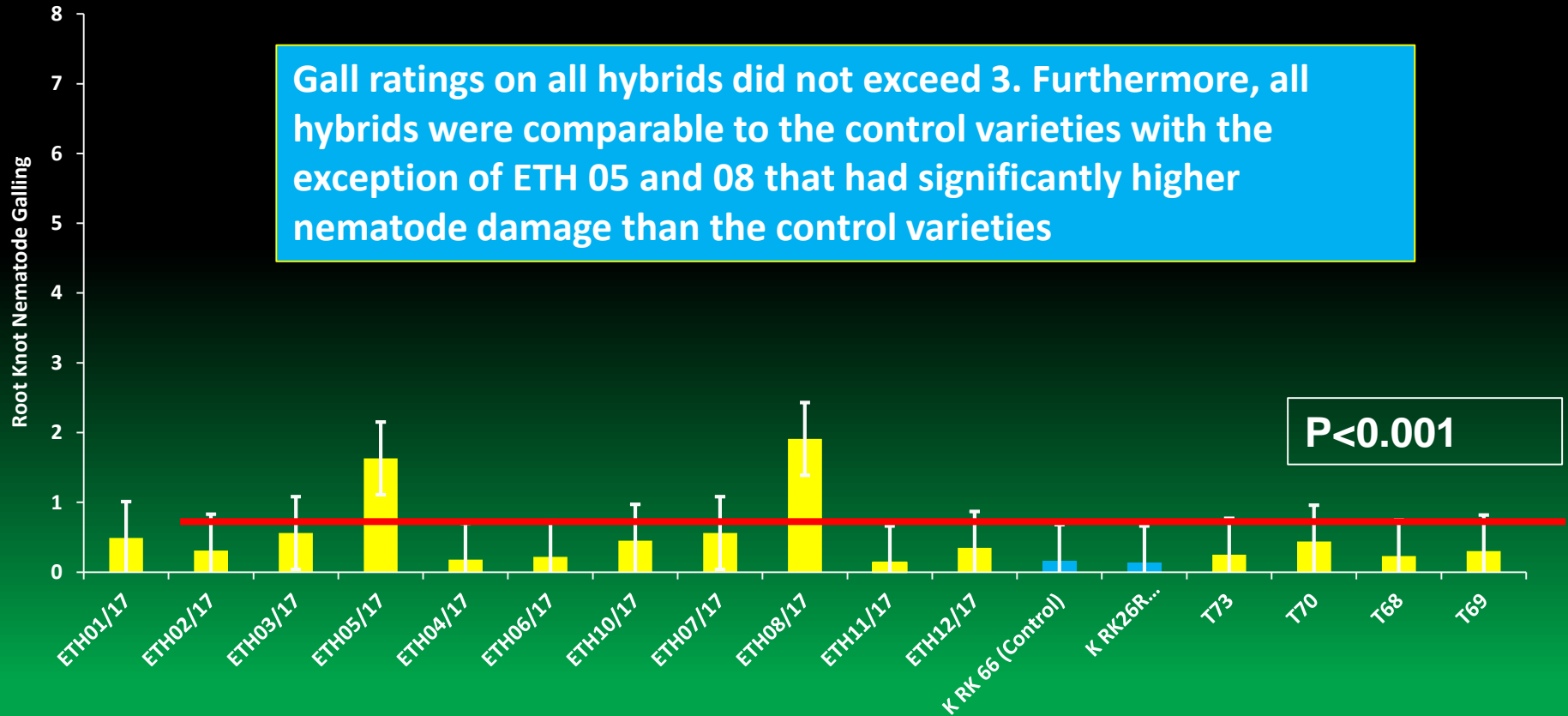
All experimental hybrids were comparable to the control varieties, there were differences in magnitude with EH11 showing the highest leaf expansion



RKN Resistance

Gall ratings on all hybrids did not exceed 3. Furthermore, all hybrids were comparable to the control varieties with the exception of ETH 05 and 08 that had significantly higher nematode damage than the control varieties

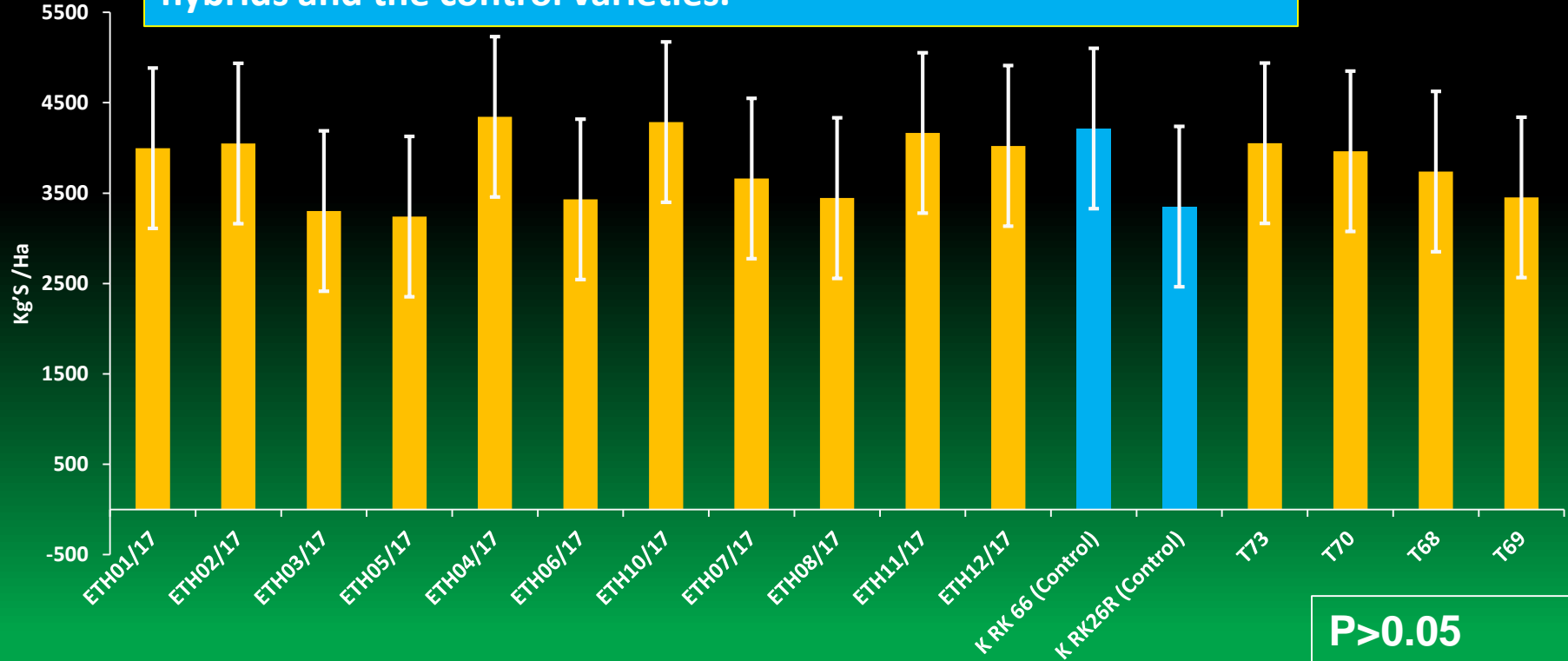
$P < 0.001$



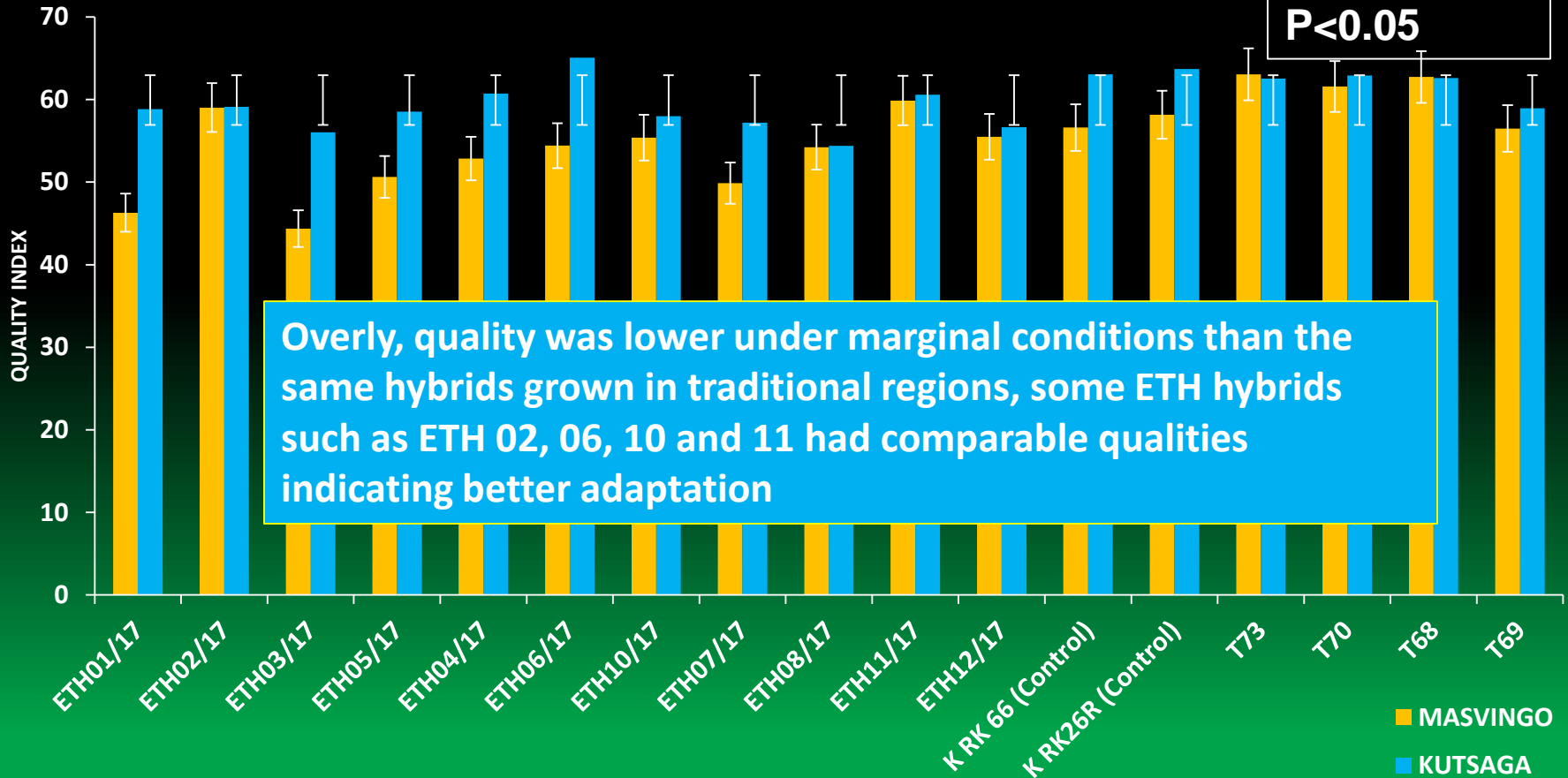
Yield

There were no significant differences between the experimental hybrids and the control varieties.

MASVINGO



Quality of cured leaf



Summary

- Leaf scorch, low yield and poor quality are the largest limiting factors to sustainable tobacco production in marginal environments
- Current varieties are not well adapted to water limitations that may be brought about by changing climate

Conclusions

- **4 promising hybrids showed adaptation to marginal environments with ideal ideotypes for short season cultivation**
- **Additional evaluations are required to evaluate seasonal performance variations as well as to determine the extent of adaptation**
- **Additional trials will be established to determine photosynthetic activity and gaseous exchange adaptations under water limiting environments**

Acknowledgements



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Universal

ZIMBABWE LEAF TOBACCO COMPANY

THANK YOU