



RiSorgo – From field to fork: First agronomic results from variety testing and pasta production with grain sorghum in Switzerland

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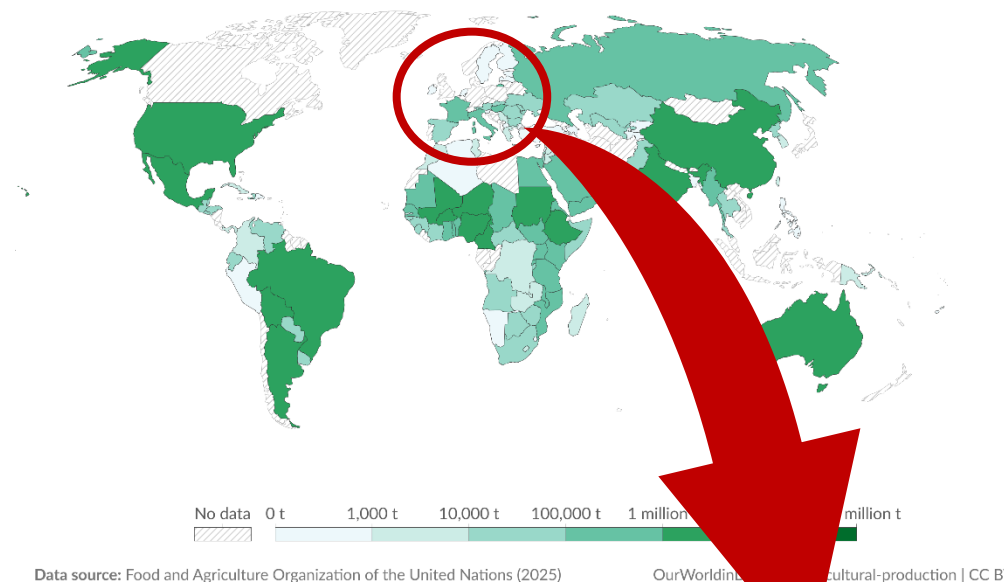


What is sorghum?

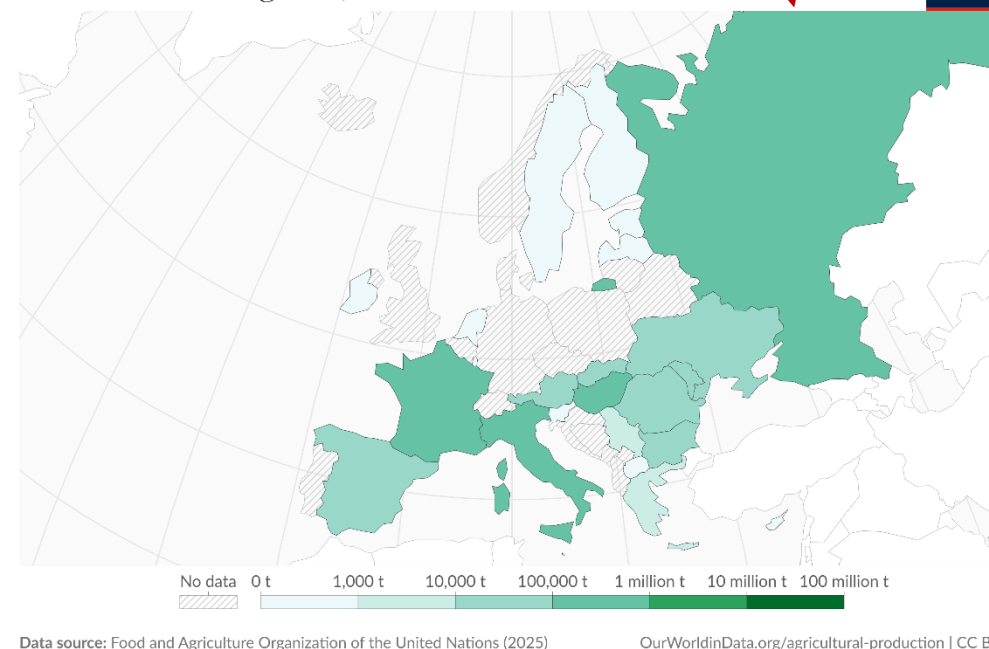
Sorghum bicolor (L.) Moench

- ✓ 5th most cultivated cereal worldwide
- ✓ C4 cereal originating from north-eastern Africa
- ✓ Used for food, feed and bioenergy
- ✓ Worldwide cultivated in Africa, Asia and the Americas
- ✓ Europe cultivated in Italy and France
- ✓ Increasing interest for diversifying cropping systems under climate change

Production of sorghum, 2024



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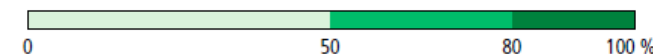
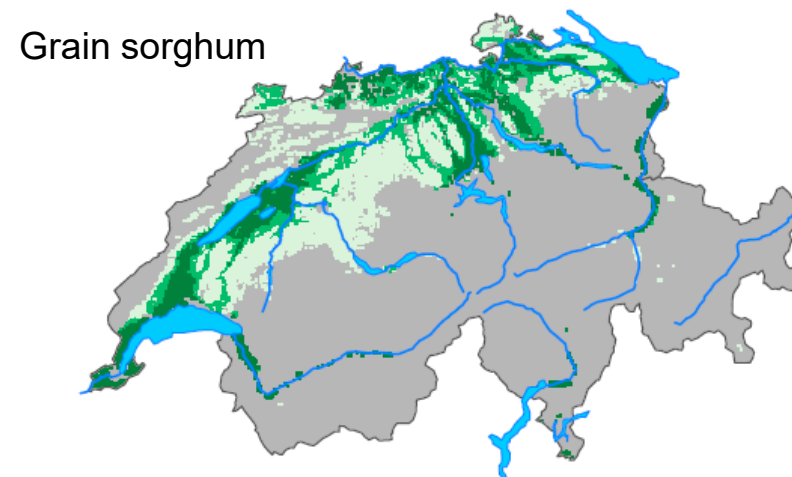
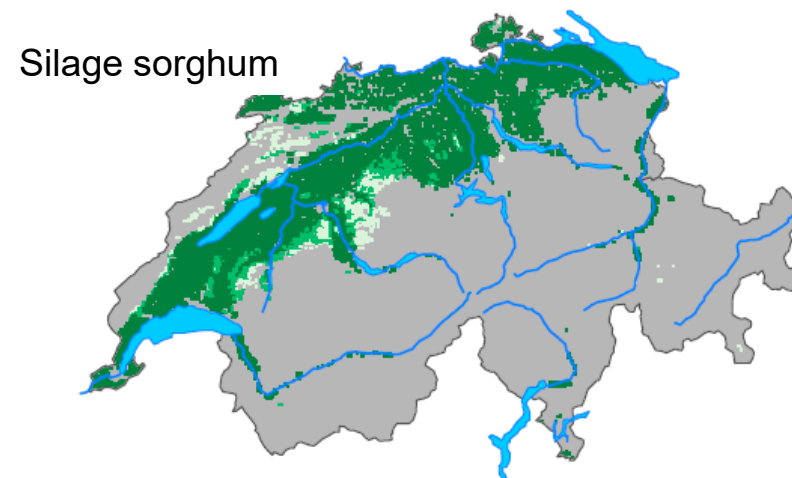




Why sorghum in Switzerland?

Around 400 ha in Switzerland (10% grain sorghum)

- ✓ Resilient C4 plant for future climatic conditions
- ✓ Low pest pressure in Switzerland
- ✓ Gluten-free grain with food potential
- ✓ Suitable climatic conditions for both silage and grain sorghum, with grain sorghum mainly limited to the warmest regions



Probability of crop maturity before 31.10
across Swiss arable land
(Bütikofer et al., 2023)



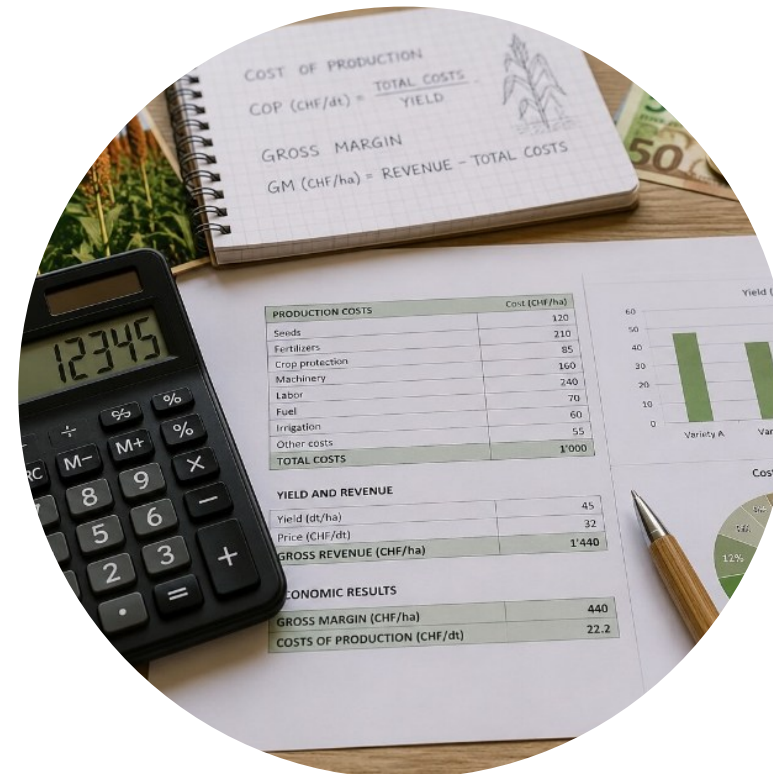
The RiSorgo project



Agronomy



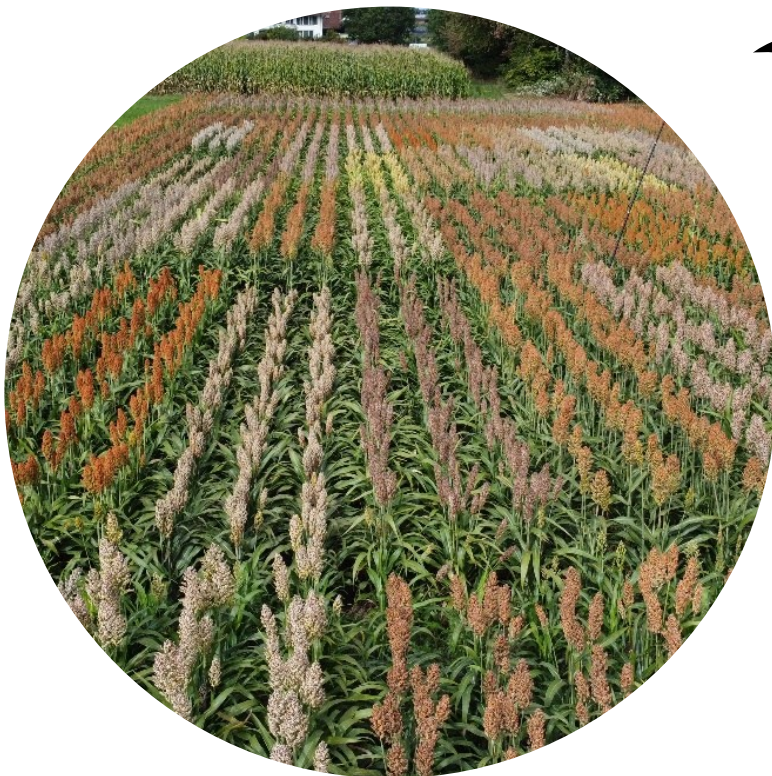
Pasta quality



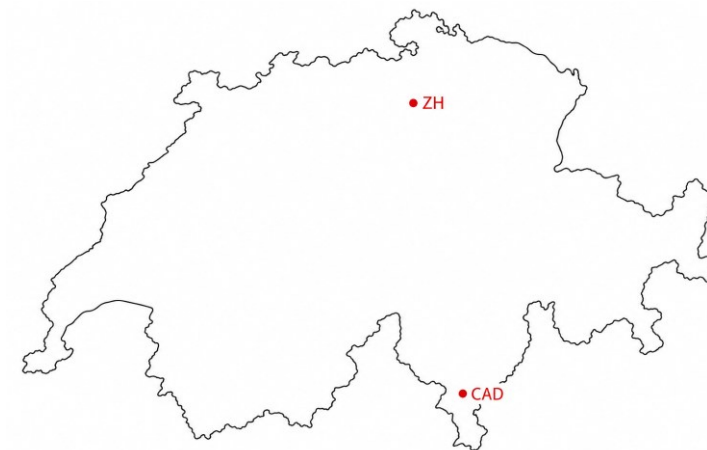
Economy



The RiSorgo project: agronomy



- ✓ 3 years (year 3 ongoing)
- ✓ 15 european varieties
- ✓ 2 sites
- ✓ Technical setup: *50 cm interrow, seeding rate 35 seeds/m², 4 replicates*



Agronomy

- Agronomic characterization: emergence, early vigour, tillering, lodging, maturity, panicle numbers, plant height, grain yield.
- Grain quality traits: protein, starch and other components
- Establishment of a VCU¹ protocol.

¹ Value of Cultivation and Use



« From field... » observations

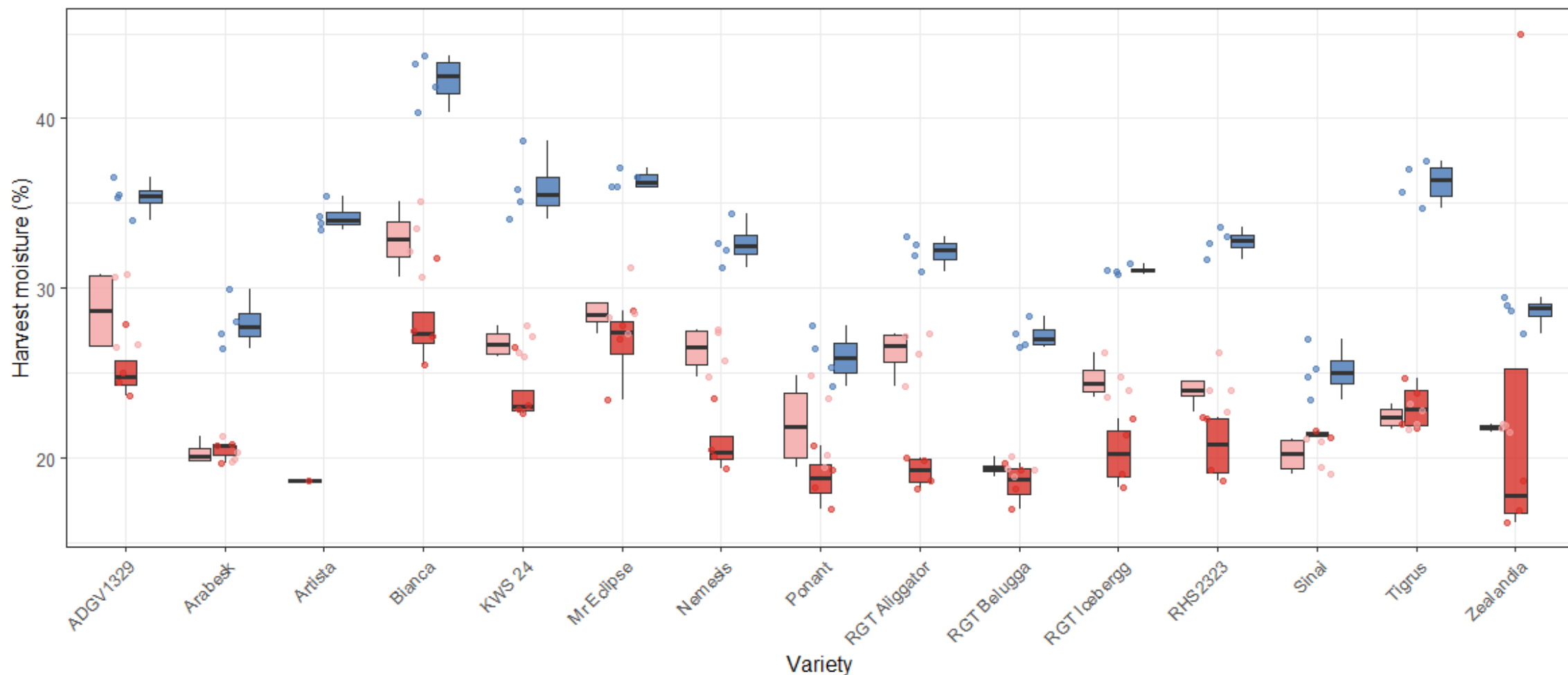




Harvest moisture

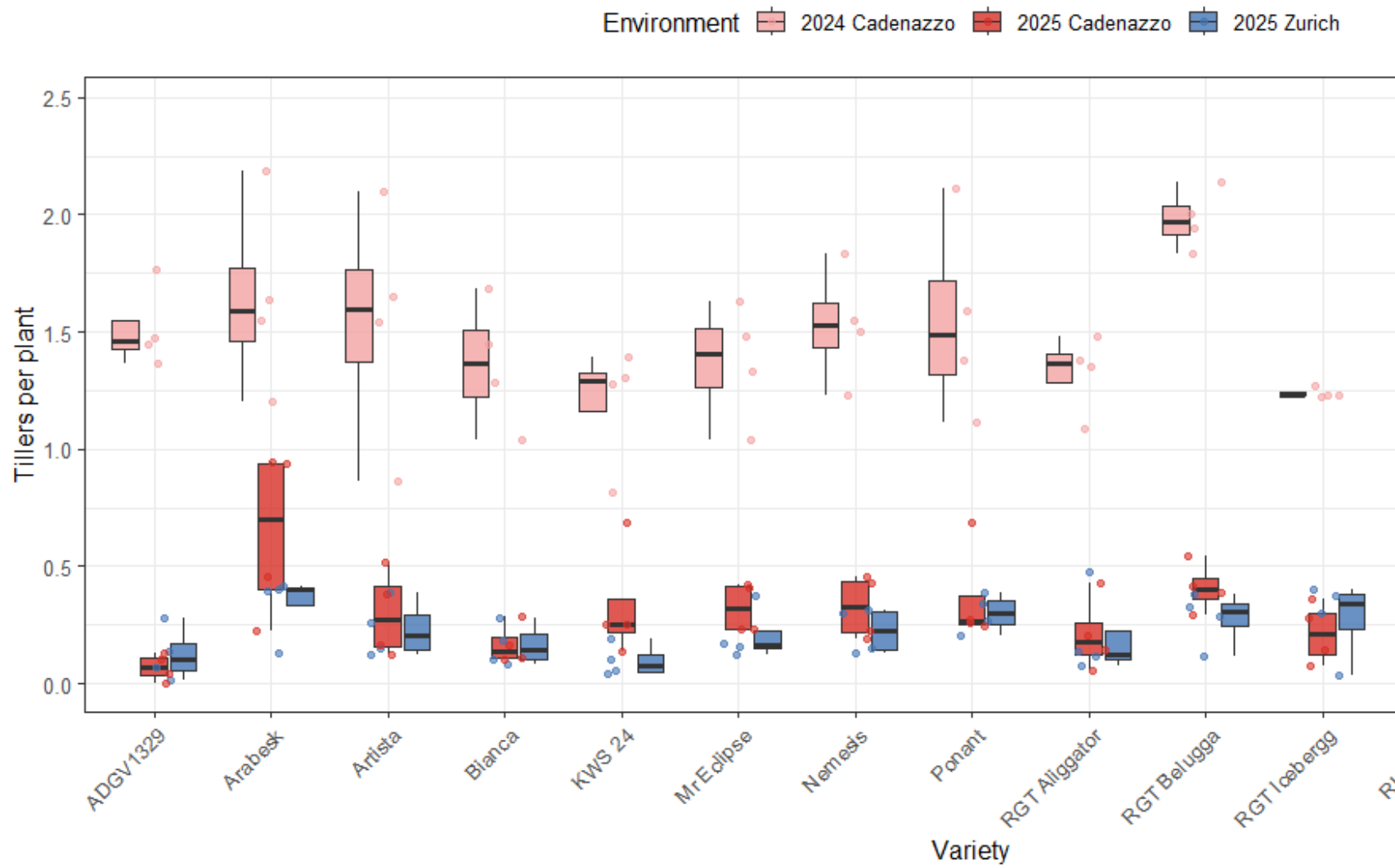
Environment ■ 2024 Cadenazzo ■ 2025 Cadenazzo ■ 2025 Zurich

Overall mean $\pm$ SD: 27 ± 6 %





Tillers per plant

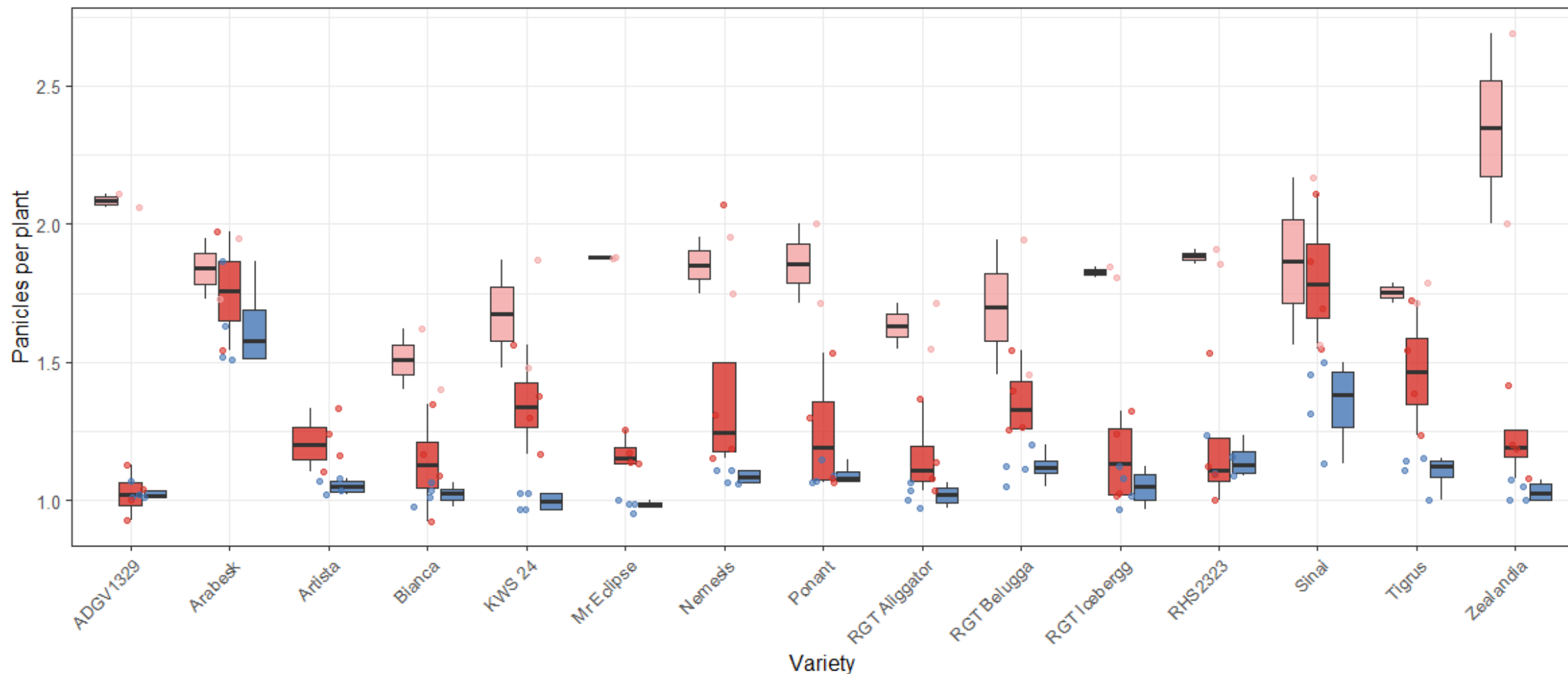




Panicles per plant

Environment 2024 Cadenazzo 2025 Cadenazzo 2025 Zurich

Overall mean $\pm$ SD: 1.3 ± 0.4

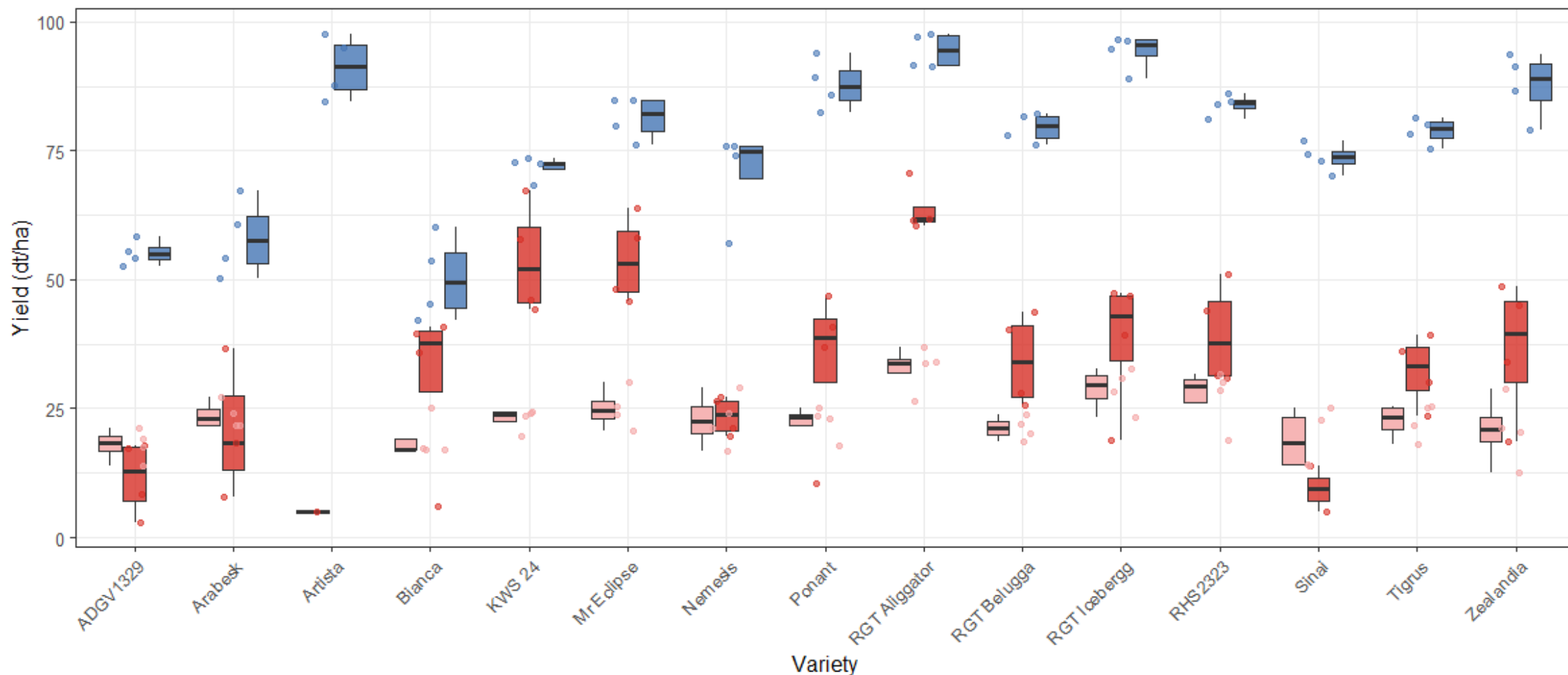




Grain yield

Environment 2024 Cadenazzo 2025 Cadenazzo 2025 Zurich

Overall mean $\pm$ SD: 46 $\pm$ 27 dt/ha

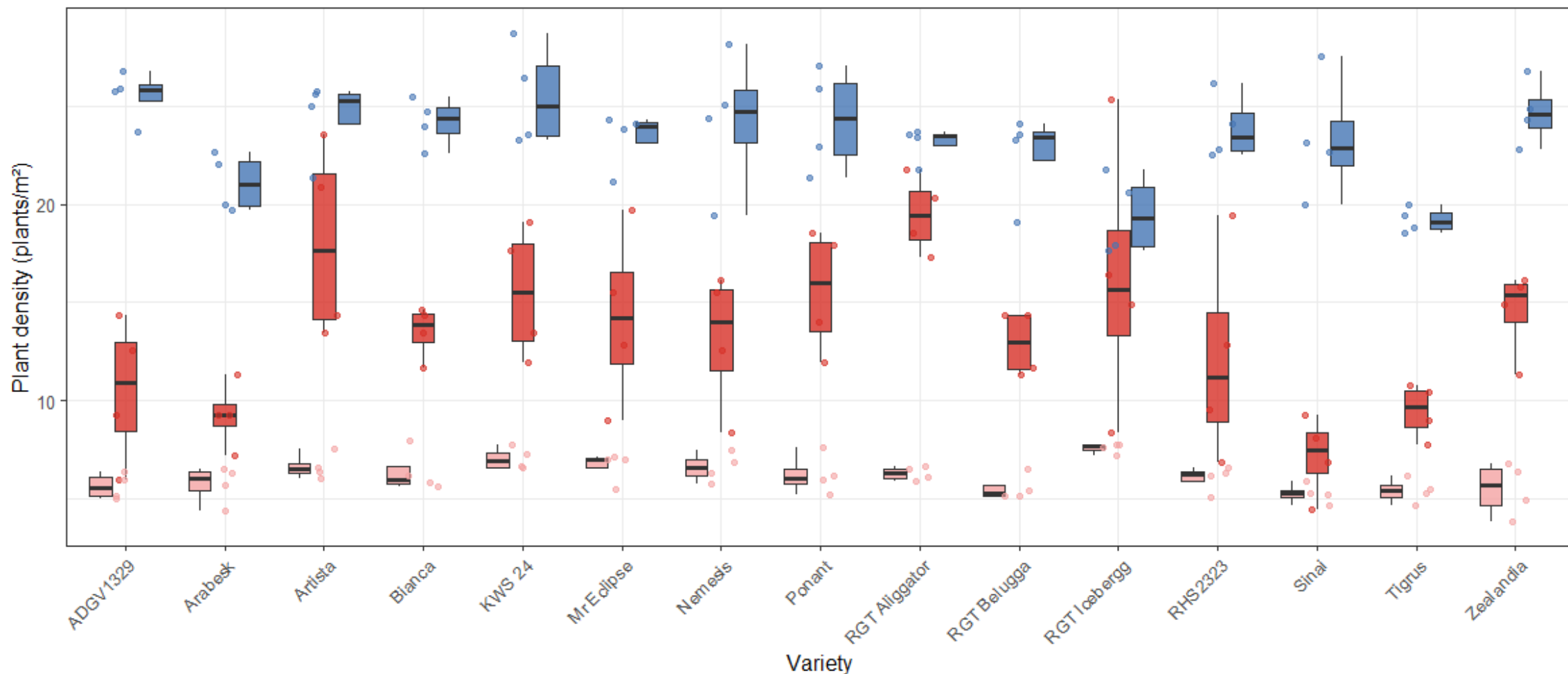




Plant density at emergence

Environment 2024 Cadenazzo 2025 Cadenazzo 2025 Zurich

Overall mean $\pm$ SD: 14.3 ± 7.7 plants/m²

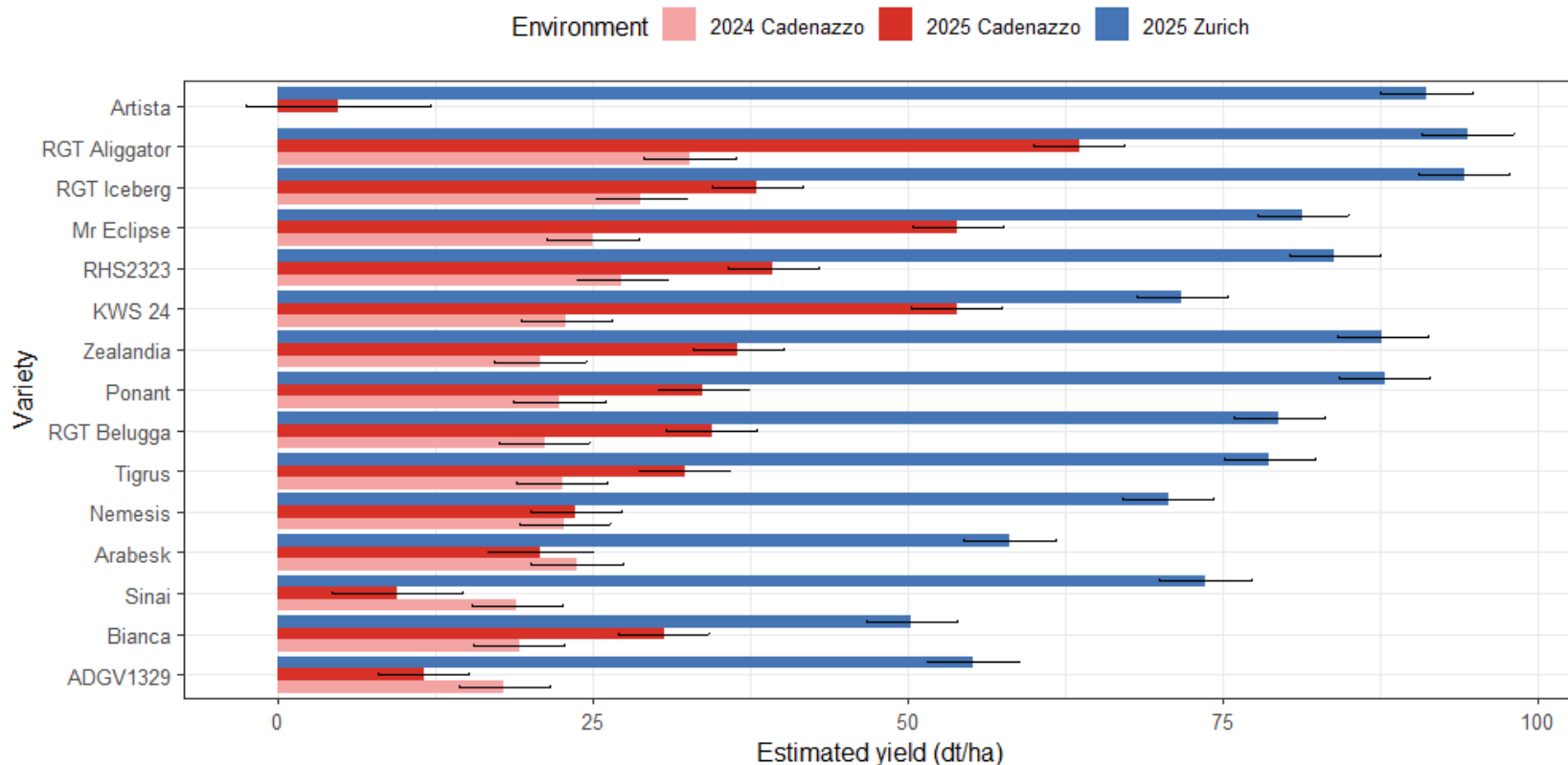




Variety × Environment interaction for grain yield

Linear mixed model

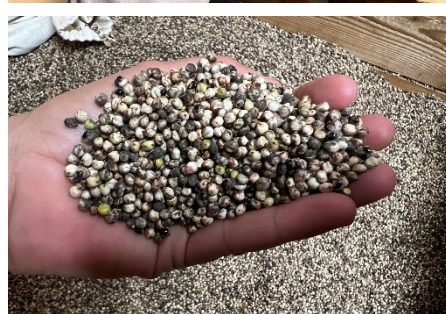
Yield ~ Variety × Environment + (1| Environment : Replicate)



P-Value	
Variety	p < 0.001
Environment	p < 0.001
Variety × Environment	p < 0.001



«...to fork» observations





Take-home messages

Adaptation

- ✓ Commercial grain sorghum varieties successfully matured under Swiss conditions

Performance

- ✓ Variety choice strongly influenced agronomic performance and grain yield
- ✓ Multi-environment testing is essential for site-specific variety recommendations

Perspective

- ✓ RiSorgo supports the development of a Swiss grain sorghum value chain, from field to fork

→ **Next step:** Ongoing 2026 field trials and pasta quality analyses will further refine these conclusions



Acknowledgements

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Uffizi federal d'agricoltura UFAG



Agroscope

Sorghum ID
IL FUTURO PUNTA SUL SORGO

GLOBOFOOD

OriginTi
DAL TICINO

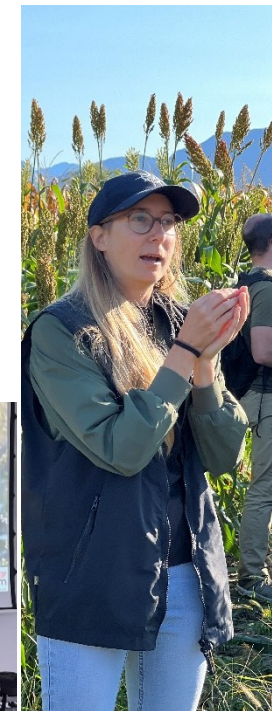


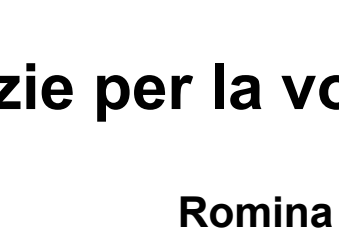
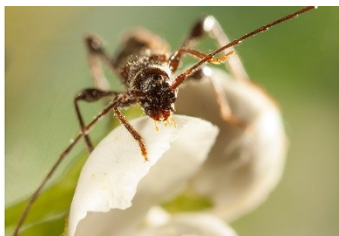
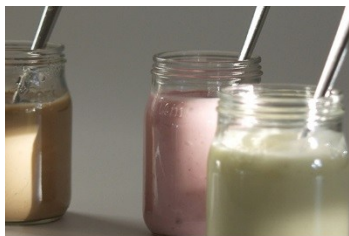
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agridea

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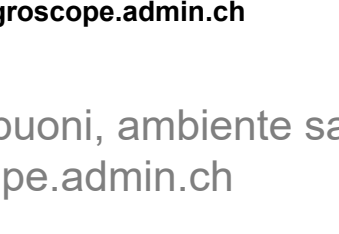


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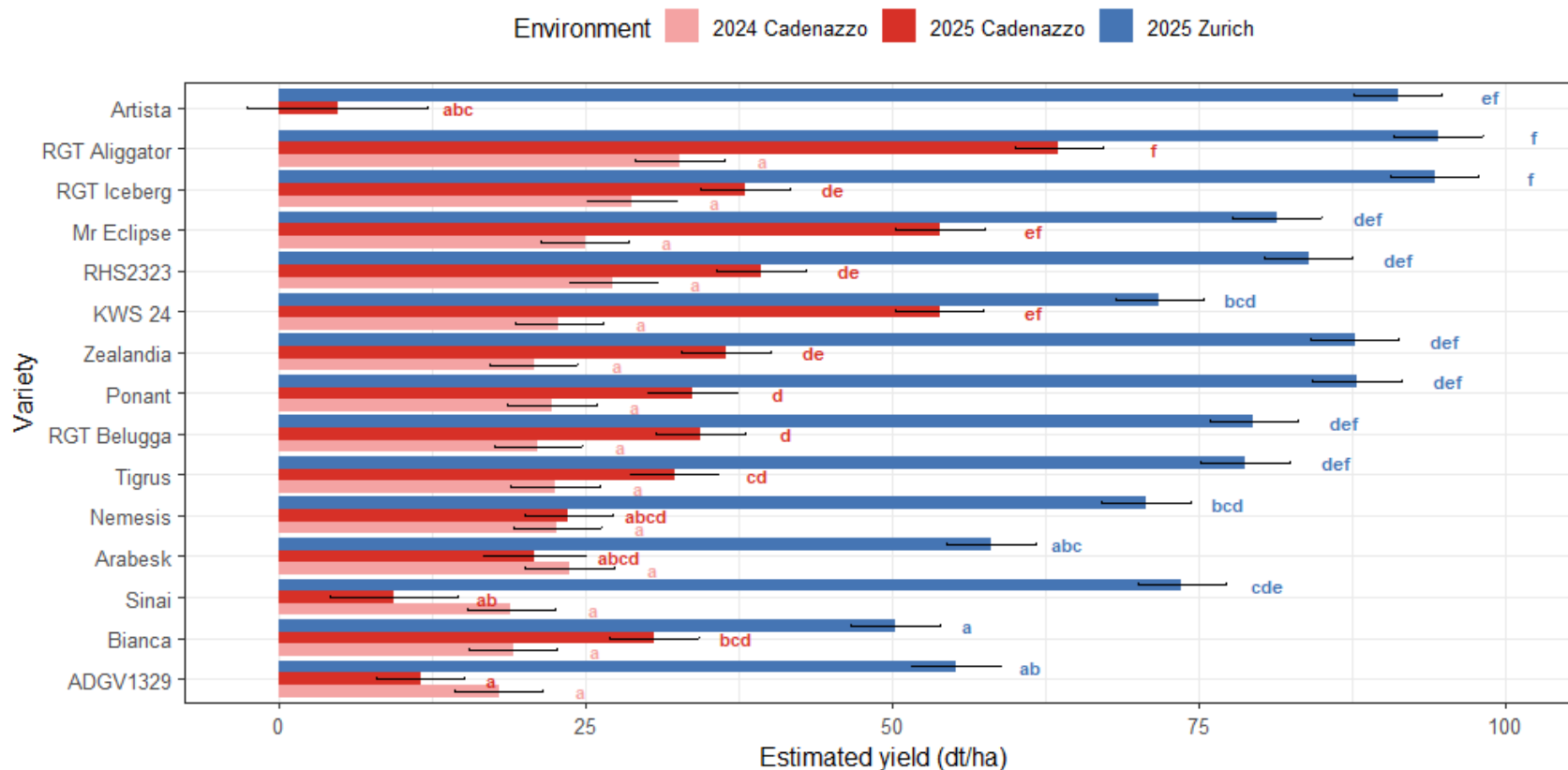




Variety × Environment interaction for grain yield

Linear mixed model

Yield ~ Variety × Environment + (1| Environment : Replicate)



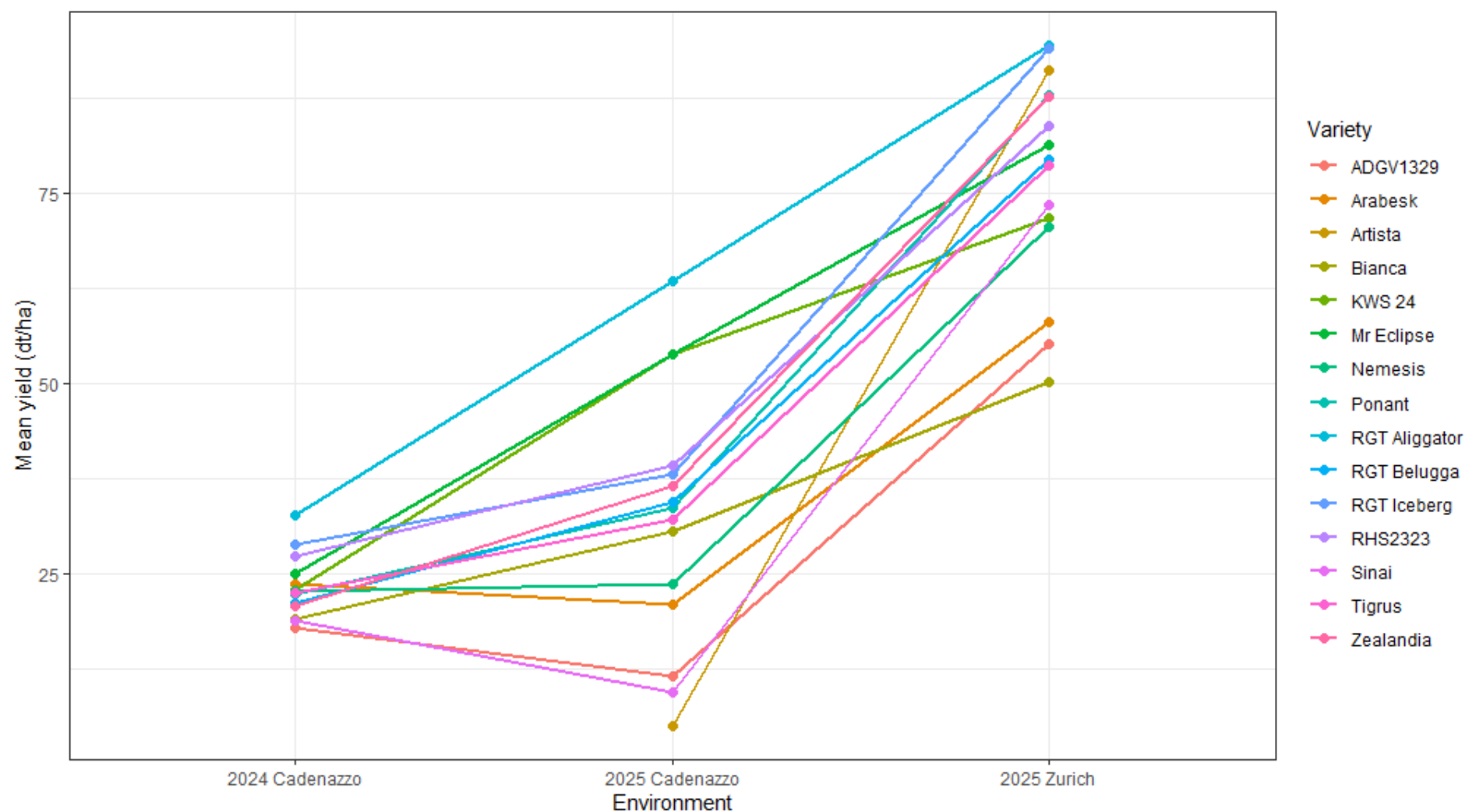
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$\text{Yield} \sim \text{Variety} \times \text{Environment} + (1 | \text{Environment} : \text{Replicate})$



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Variety × Environment	p < 0.001