PRESENTATION

Session:
A LOOK AT BREEDING AND AGRICULTURE

Title:
Long-term assessment of correlations between climate and cotton fiber quality parameters

Speaker:
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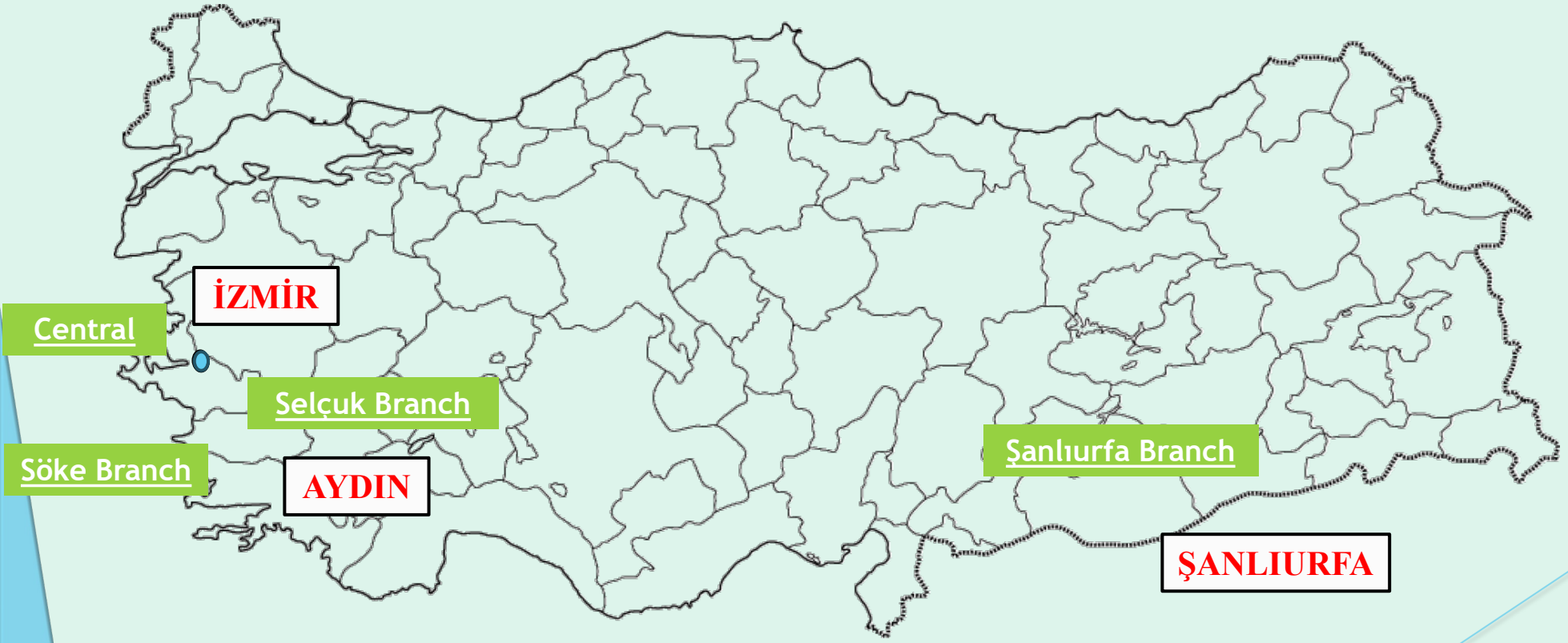

Annual Analysis Capacity is 200.000 Bale

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We test our mensurement proficiency in two different organizations

Commercial Standardization of Instrument Testing of Cotton

International Cotton Advisory Committee

Discover Natural Fibres Initiative

ICA Bremen

The Global Centre for Cotton Testing and Research

ICA Bremen Cotton Round Trial

in Coorperation with Bremer Baumwollboerse

carried out by Bremen Fibre Institute (FIBRE)

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Statistical Analysis of Aegean Cotton by Years in Türkiye

Uster Statistics 2023

The common quality language for the textile industry

Long-term assessment of correlations between climate and cotton fiber quality parameters

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Long-term assessment of correlations between climate and cotton fiber quality parameters

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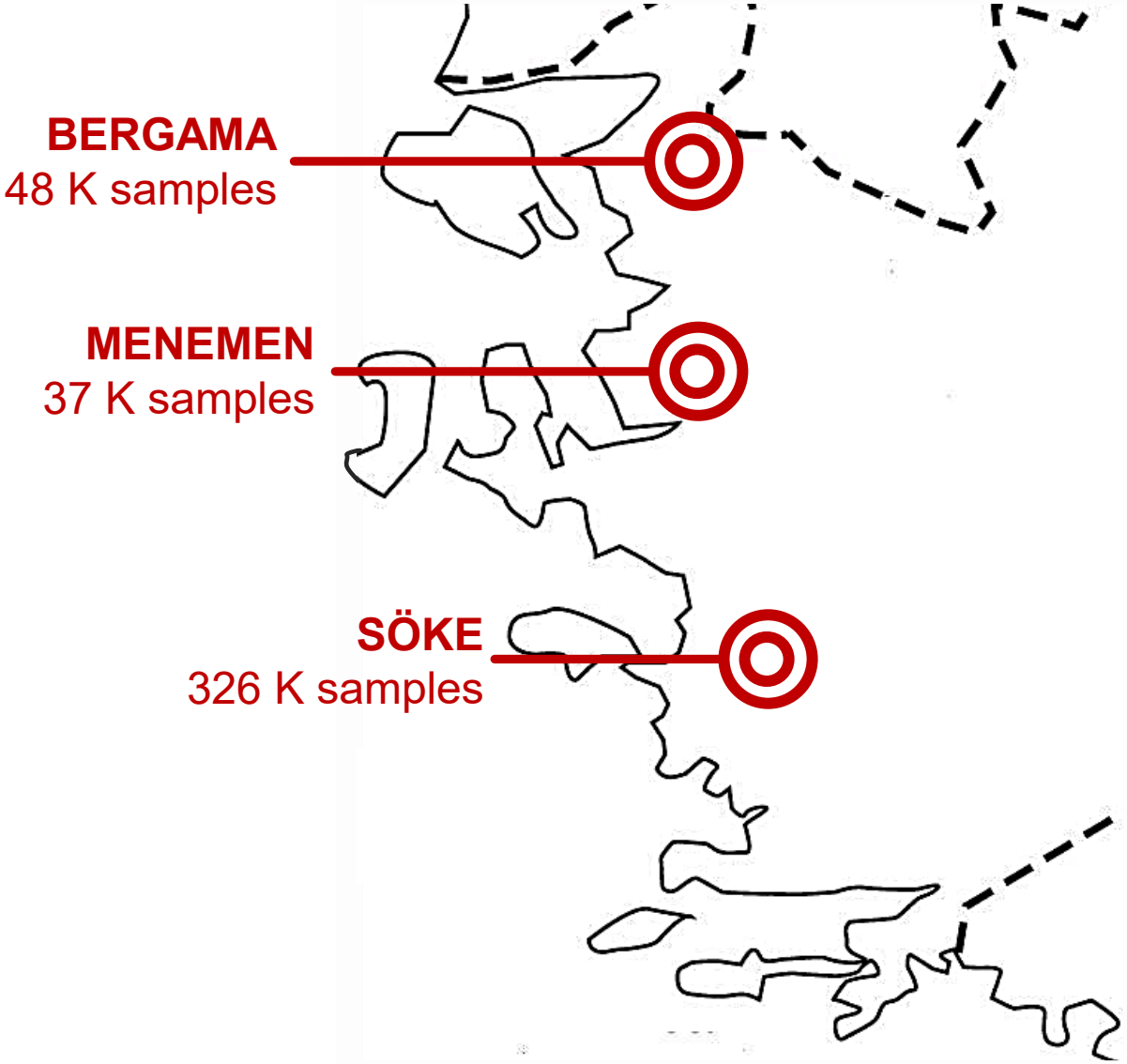
Primary Cotton-Producing Regions: The main areas for cotton production are Bergama, Menemen, and Söke.

Key Quality Parameters: Four critical quality parameters include mic, UHML, UI, and Str.

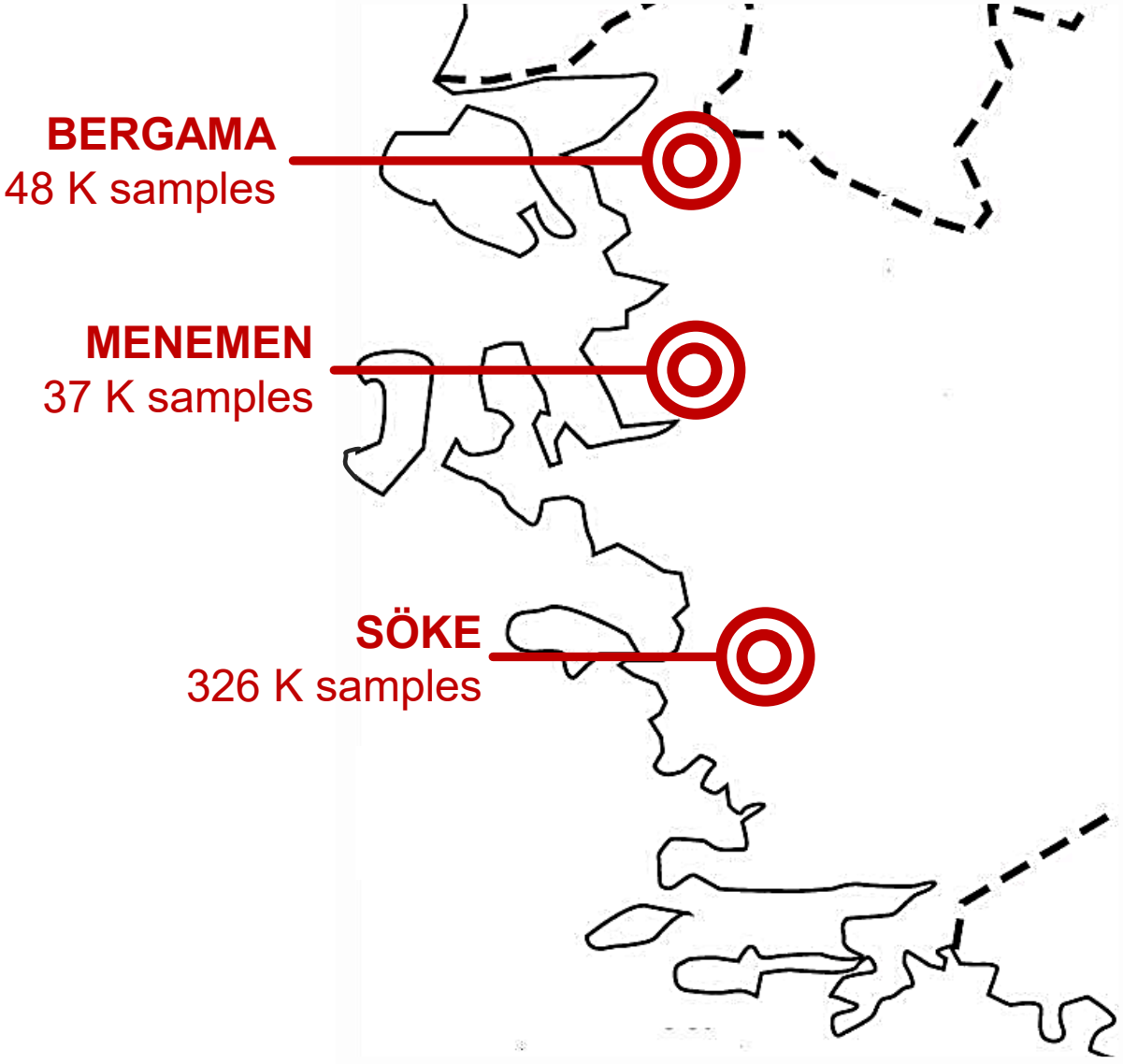
Climate Factors: Six essential climate parameters are max.°C, min.°C, avg.°C, precipitation, humidity, and wind speed.

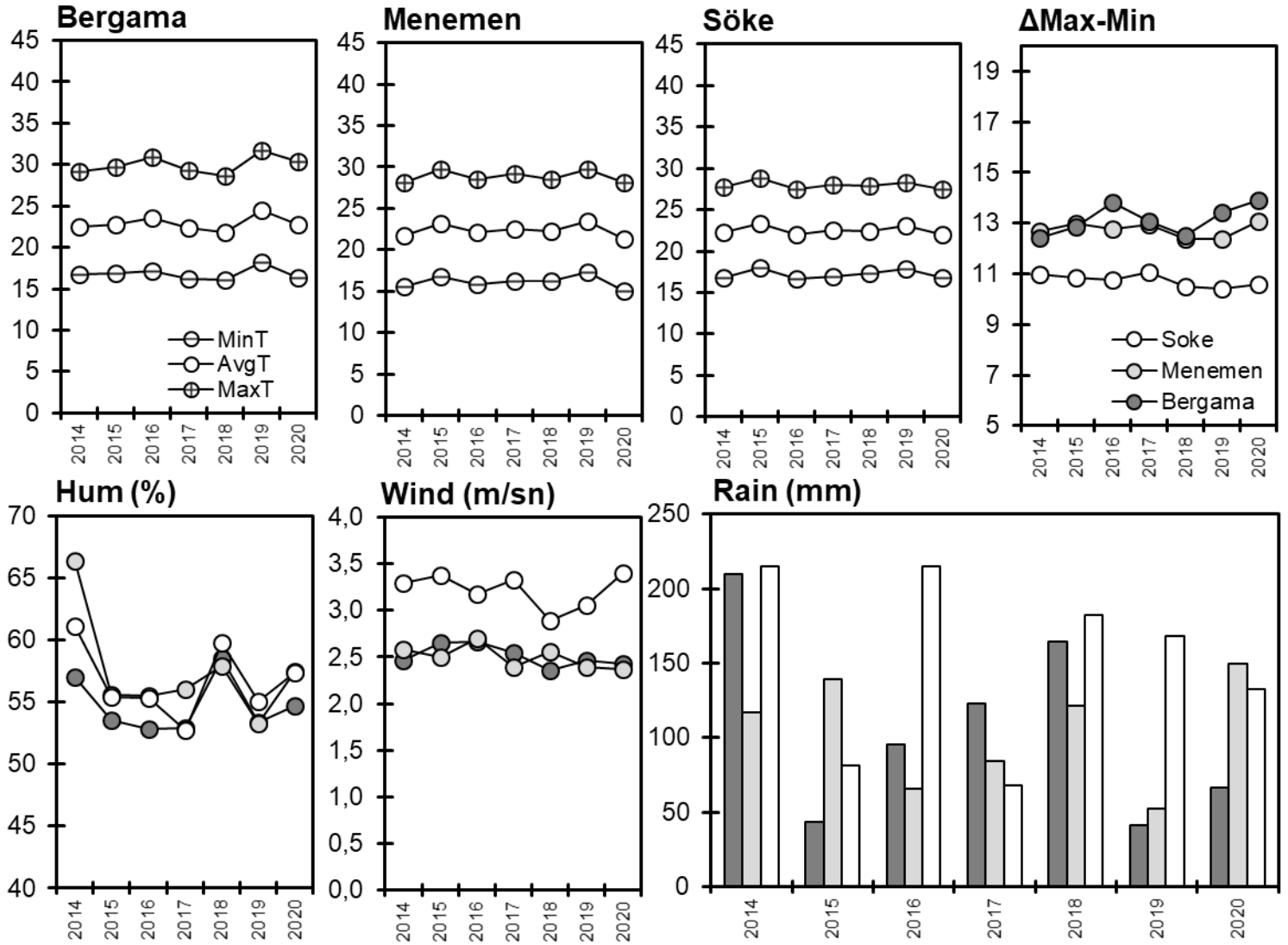
Significant Phenological Periods: The five pivotal stages in the cotton growth cycle are emergence, flowering, boll formation, boll development, and maturation.



Questions:

- Is there a significant variation in cotton **fiber quality** across **different years**?
- Does the quality of cotton fiber exhibit significant **regional variations**?
- To what extent does **climate** variability during various **developmental stages** of the cotton plant contribute to changes in **fiber quality**?
- Are there notable **regional** differences in the **relationships between** various parameters of cotton **fiber quality**?



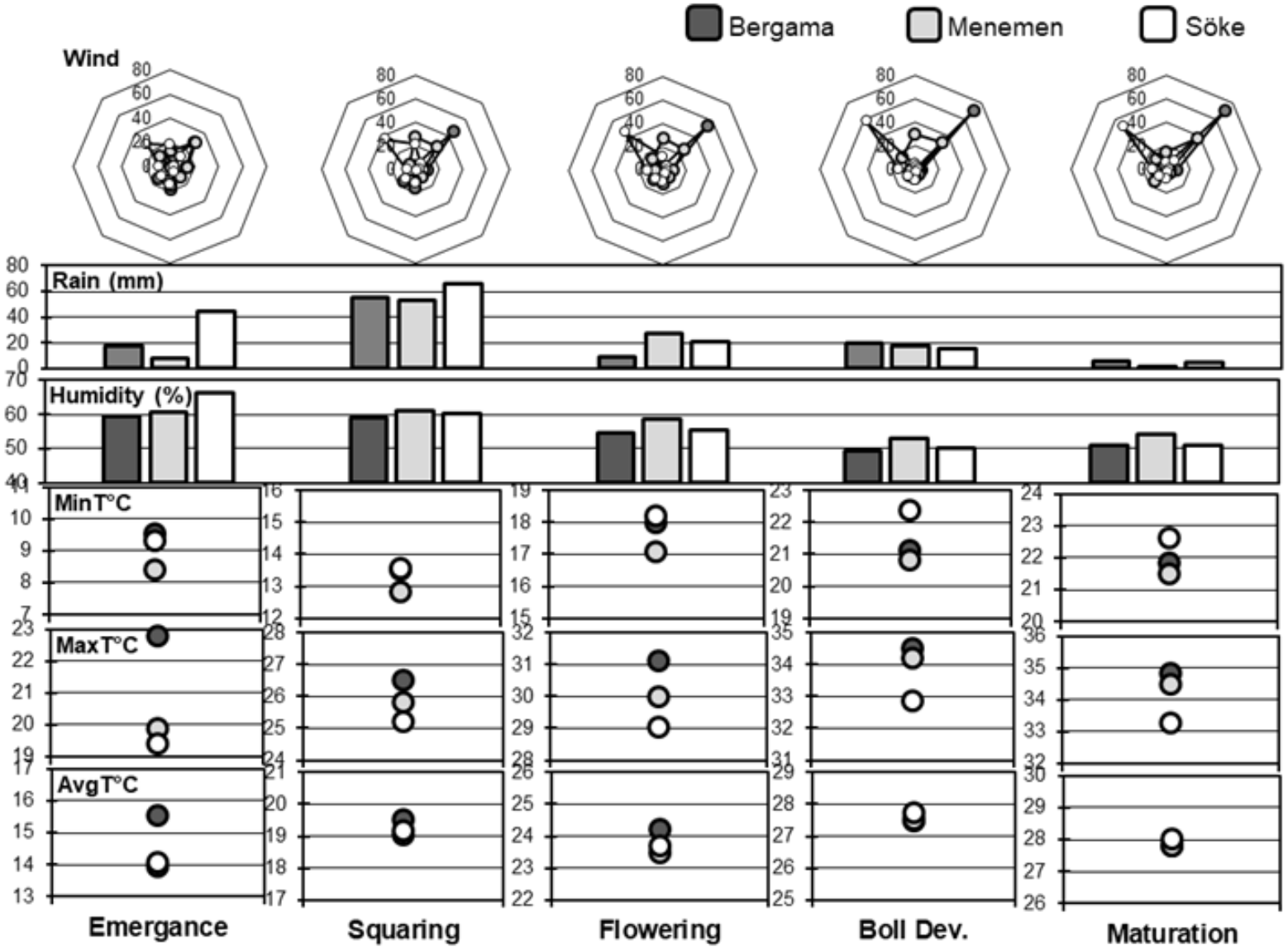


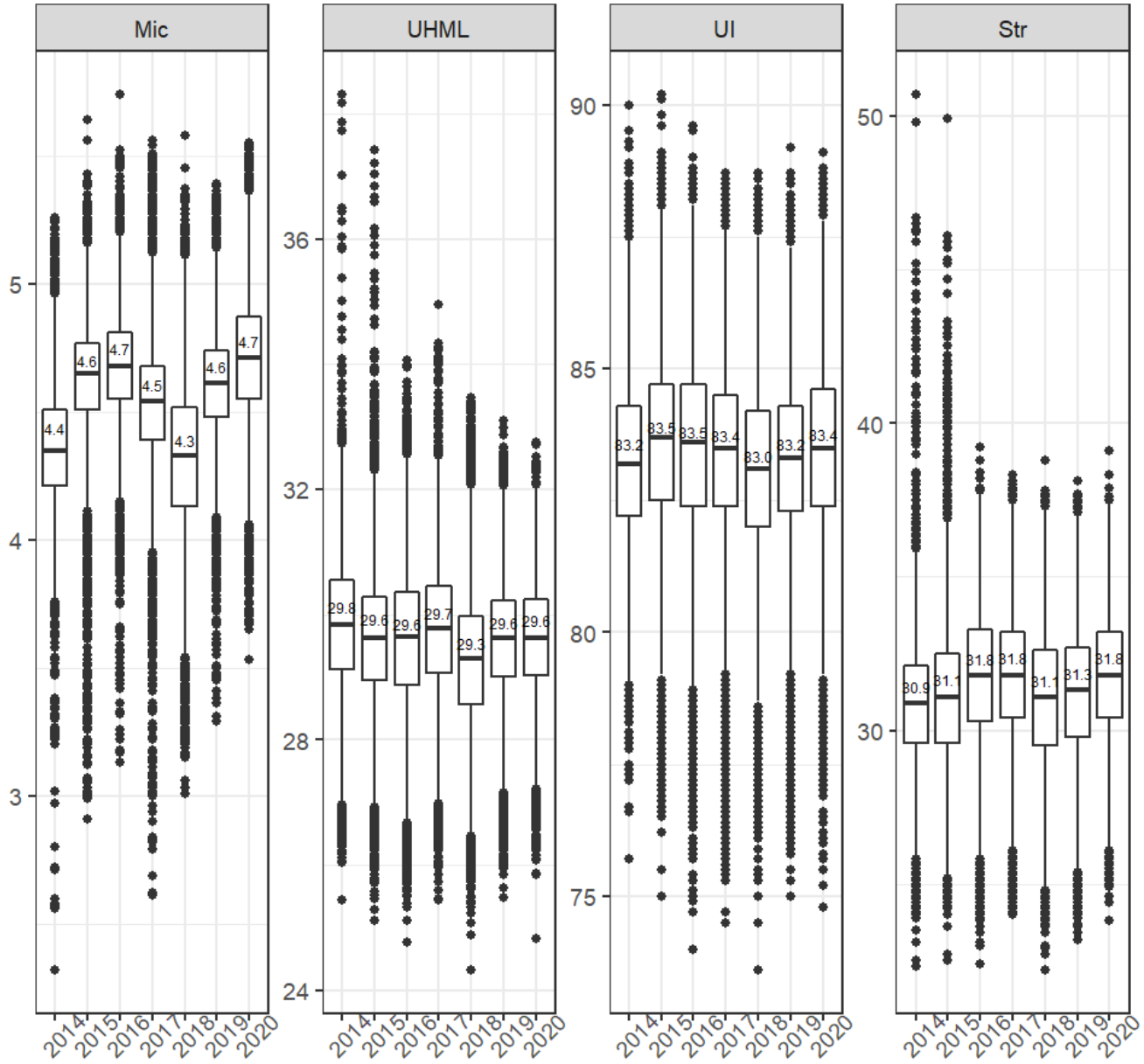
Key findings

- Similar **average temperatures** observed across all regions.
- **Söke** experiences a lower **ΔMax-Min**.
- Elevated **humidity** levels recorded in **2014 and 2018**.
- **Söke** exhibits higher **wind speeds** compared to other regions.

Key findings

- **Bergama** experiences **NE winds**, while **Söke** encounters **NW winds** after flowering.
- **Menemen** demonstrates **higher humidity** levels during the reproductive stage.
- **Söke** exhibits **lower maximum** temperatures (-1.5 °C) and **higher minimum** temperatures (+1.1 °C) during fiber formation.



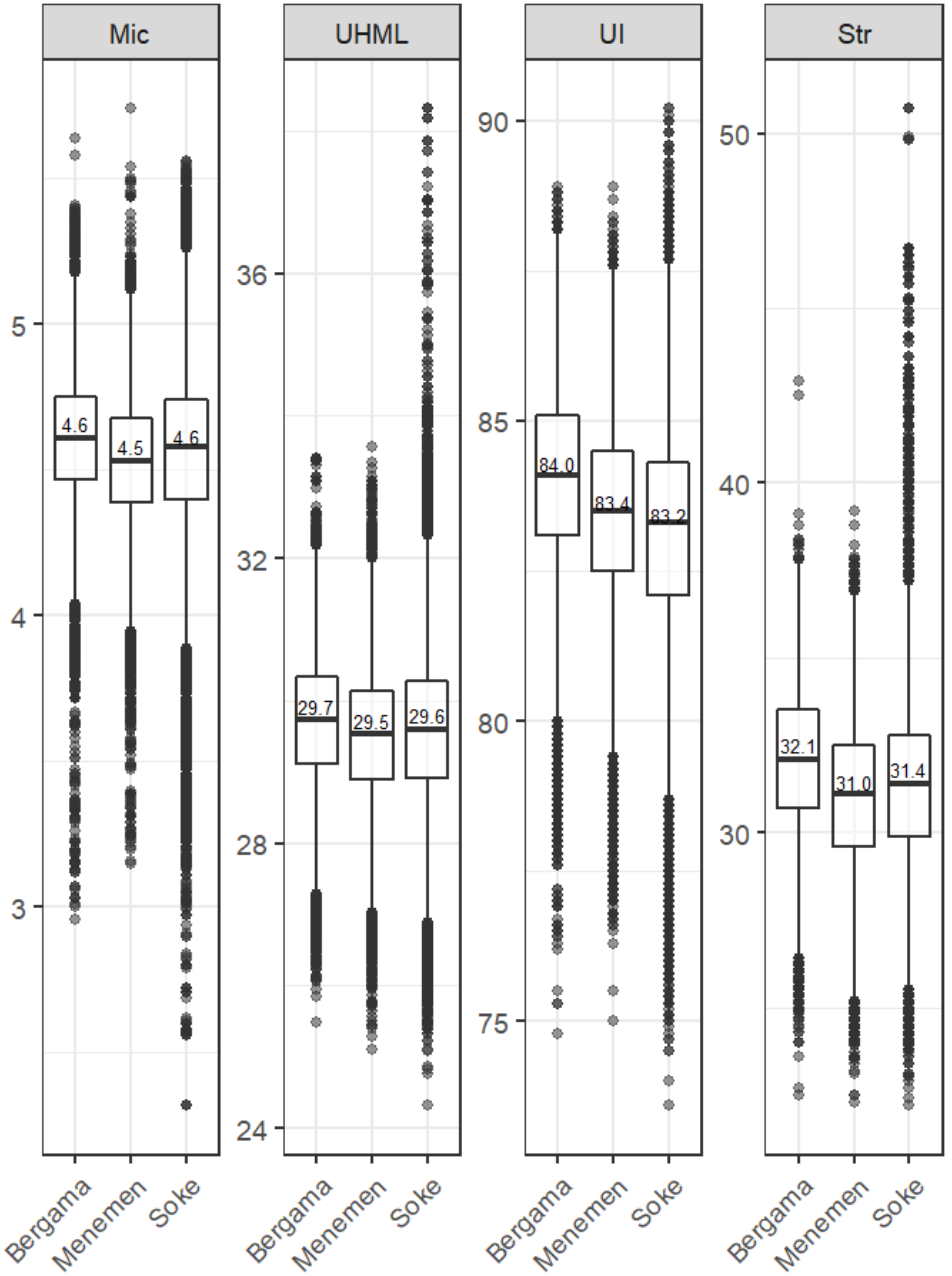


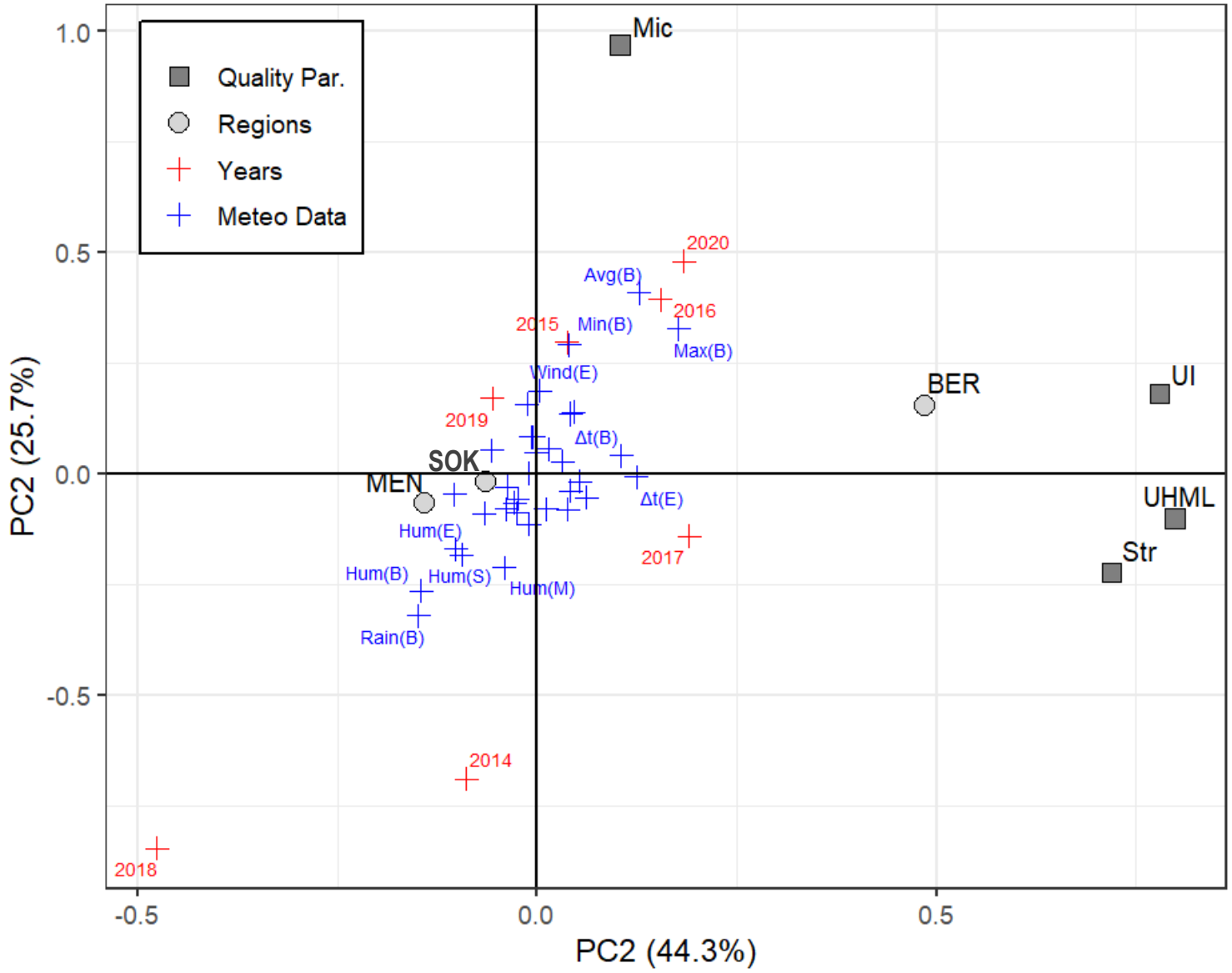
Key findings

- **Micronaire** was lower in 2014 and 2018, and higher in 2020.
- **UHML** showed minimal fluctuation, with notable variations towards higher values in 2014 and 2015.
- **UI** remained relatively consistent between 83.0% and 83.6%, with high variation between 80% and 87%.
- **Strength** values displayed wider variations in 2014 and 2015, ranging between 30.9 and 31.8 g/text.

Key findings

- Slightly higher **micronaire** values were observed in Bergama and Söke.
- Bergama showed slightly higher **UHML**.
- Bergama recorded notably higher **UI** values.
- The highest **strength** value was recorded in Bergama, followed by Söke.





- **BER:** Bergama
- **MEN:** Menemen
- **SOK:** Söke

E: Emergence
S: Squaring
F: Flowering
B: Ball development
M: Maturity

Min: Min. temp.(°C)
Max: Max. temp.(°C)
Avg: Average temp.(°C)
Δt: Max-Min (°C)
Hum: Air humidity (%)
Rain: Rain amount (mm)
Wind: Wind speed (m/sn)

Conclusions

- Higher air humidity is suggested to be associated with lower **micronaire** values in 2014 and 2018.
- **Bergama** exhibited relatively higher quality properties, particularly in uniformity index, UHML and strength.
- **Air humidity** during the fiber development stage of cotton in Menemen may influence fiber quality parameters.

Conculusions

- **Average**, **maximum**, and **minimum temperatures** during boll development could be suggested as one of the main determinants for quality properties, especially for micronaire.
- **Air humidity** during boll development negatively affects each quality parameter.
- **Söke** has an advantage due to strong northeast winds that reduce air humidity.

Future plans

- Analysis of a total of **12 years** of dataset from **19 locations** in the region will be conducted.
- **Field-based** measurements will be carried out for 2 years in three locations (totaling 30 points).
- **Machine learning** models will be implemented to estimate fiber quality parameters using meteorological datasets.

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Thank you!

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