Extrapolation of the LTE data for regional prediction of crop production and agro-environmental impacts in the Czech Republic with the EPIC-based modelling system

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Crop Research Institute in Prague

- National authority in agricultural research, since 1951
- Long-term Experiments (LTE)
  A. CROP-oriented (varieties, crop rotation)
  B. NUTRITION-oriented (organic vs. mineral fertilization)
  C. AGROTECHNICS (soil management and protection)
Conceptual background

- LTE: local managemental strategies
- EPIC-IIASA crop modelling system: spatial pattern
- **LTE data for calibration and validation of regional modelling**
- soil organic carbon balance
EPIC-IIASA (CZ)

- simulation infrastructure
- crop production and agro-environmental parameters
- calibration with LTE data

LAU1 administrative unit
  * climatic region
  * soil type region

977 simulation units
Inputs

- CLIMATE (daily weather): clima grid of Agri4Cast¹
- SITE (elevation, slope, field size, slope length): DEM
- SOIL (typical soil profiles): soil maps, soil profiles
- CROP MANAGEMENT: regional setup

## 4.3.2. Spring Barley

### Phenological Crop Calendar

Table CZ06 – Phenological crop calendar for spring barley

<table>
<thead>
<tr>
<th>region</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
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<tbody>
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</tbody>
</table>

Key:
- X: Starting
- X: Flowering
- X: Heading
- X: Anthesis
- X: Maturity

### Spring Barley Planting Scenarios

- **A1**: Barley planted in January, February, and March.
- **A2**: Barley planted in April, May, and June.
- **A3**: Barley planted in July, August, and September.
- **A4**: Barley planted in October, November, and December.

**VOLTR vs. EPIC-IIASA (CZ): Run 5**

Yield Weighted Mean

Max Yield

25% Most Productive Years
Next steps

• top 10 crops in CZ
• universal crop rotation system
• meteorological data refinement

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>winter wheat</td>
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<tr>
<td>2</td>
<td>winter rapeseed</td>
</tr>
<tr>
<td>3</td>
<td>spring barley</td>
</tr>
<tr>
<td>4</td>
<td>corn</td>
</tr>
<tr>
<td>5</td>
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<tr>
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<td>corn</td>
</tr>
<tr>
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<tr>
<td>9</td>
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</tr>
<tr>
<td>10</td>
<td>oat</td>
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</tbody>
</table>
Thank You for Your Attention.

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