Introduction
Forages from semi-natural grasslands are an important source of feed for dairy cows in Southwest Germany. Thus, the dynamics of forage growth and nutritive value on these pastures must be known for an efficient and sustainable use of these resources.

Objective
- Analyse the dynamics in plant growth, botanical composition, and nutritional quality of semi-natural pastures in the grazing season 2019.

Study Site and Methods
Case-study performed on 7 commercial organic dairy cattle farms in Southwest Germany from April to October 2019 (Table 1):
- 40 exclusion cages (1 m²) on 16 pastures (1.5-3 ha)
- Weather stations to record humidity and temperature
- Vegetation sampling inside and outside the cages
  - Visual estimation of species abundance
  - Above-ground plant biomass
  - Nutritional quality estimated by NIRS

Table 1. Characteristics of seven commercial organic dairy farms in Southwest Germany during the grazing season 2019 (arithmetic means; standard deviation is given in parentheses).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Farm A</th>
<th>Farm B</th>
<th>Farm C</th>
<th>Farm D</th>
<th>Farm E</th>
<th>Farm F</th>
<th>Farm G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altitude (m a.s.l.)</td>
<td>788</td>
<td>537</td>
<td>387</td>
<td>678</td>
<td>807</td>
<td>549</td>
<td>302</td>
</tr>
<tr>
<td>Temperature (°C)</td>
<td>14 (3.7)</td>
<td>15 (4.4)</td>
<td>15 (4.4)</td>
<td>14 (4.1)</td>
<td>14 (4.3)</td>
<td>15 (3.9)</td>
<td>15 (4.0)</td>
</tr>
<tr>
<td>Rainfall (mm)</td>
<td>103 (50.3)</td>
<td>81 (29.8)</td>
<td>99 (42.4)</td>
<td>76 (31.8)</td>
<td>88 (44.3)</td>
<td>93 (27.4)</td>
<td>81 (24.9)</td>
</tr>
<tr>
<td>Breed</td>
<td>S</td>
<td>S, CB</td>
<td>HF</td>
<td>S, CB</td>
<td>S</td>
<td>BS, S</td>
<td>BS</td>
</tr>
<tr>
<td>Dairy cows (n)</td>
<td>27</td>
<td>35</td>
<td>68</td>
<td>40</td>
<td>42</td>
<td>67</td>
<td>40</td>
</tr>
<tr>
<td>Grazing area (ha/farm)</td>
<td>8.2</td>
<td>10.0</td>
<td>36.9</td>
<td>3.0</td>
<td>17.2</td>
<td>9.9</td>
<td>6.2</td>
</tr>
<tr>
<td>Pasture cages (n)</td>
<td>6</td>
<td>5</td>
<td>10</td>
<td>2</td>
<td>7</td>
<td>1</td>
<td>8</td>
</tr>
</tbody>
</table>

Analysis performed on forage biomass: a. C: above sea level; S: Simmental; CB: crossbreed; HF: Holstein Friesian; BS: Brown Swiss; Rot: rotational grazing; Short-grass: short-grass grazing; Cont.: continuous grazing

Results
Seasonality had an effect on forage biomass ($P = 0.001$), growth rate ($P = 0.24$) was not influenced by grazing system (Fig. 4). The crude protein (CP), neutral detergent fiber (NDF), and acid detergent fiber (ADF) were influenced by seasonality and grazing system on forage biomass ($P = 0.001$). Proportions of clover and herbs differed between along the season ($P = 0.01$), but not between grazing systems.

Acknowledgements
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Discussion
- Maximum forage biomass production in mid-summer
- Nutritional value (CP and NDF) followed seasonal pattern
- Phenological development in the semi-natural grasslands
- Grazing system influenced more nutritional composition
- Evaluating grazing management difficult, factors cannot always be measured statistically.

Conclusions
- Plant growth, botanical composition, and nutritional quality vary with season and grazing management.
- Further research needed to predict dynamics in quantity and quality of forage on semi-natural grasslands to optimize their utilization.