A system to optimize forage crop variety trials for regionalized Recommended Lists in Germany
A system to optimize forage crop variety trials.....
⇒ regulatory framework

- Federal talks on governmental field trials by the Ministers for Agriculture Oct. 7th 2004 at castle Warberg resulting in:
  - „Trilaterale Vereinbarung“ (26.06.2007) trilateral agreement among:
    - the responsible institutions in the federal states (LDS) and
    - the governmental institution (BSA) for variety-trials and
    - the German Plant Breeders' Association (BDP)
  - „Bilateraler Vertrag“ (27.09.2006) bilateral treaty between LDS-BSA
A system to optimize forage crop variety trials.....

⇒ General principles for all crops (really new)

- Splitting up Germany into crop specific areas and collaboration of federal states, which are part of these areas, with the objective of a better local analysis of the combined data basis.

- New statistical methods und consistent software are collectively implemented (“Hohenheim-Gülzower Serienauswertung”; PIAF [SAS])

- Organized supplementation of the data base of regional post-registration (state) variety trials (LSV), with the national VCU-trials (WP).
A system to optimize forage crop variety trials.....

⇒ General principles for all crops (just codified)

- Common rules for a systematic variety-transfer from VCU-trials to trials for local recommendation (LSV)
- Combined trials:
  Integration of LSV and WP (if possible ⇐ size!).
- Reduction costs of field trials performed by federal states to the minimum necessary for advice to the local farmers – considering arrangements at federal level between the responsible institutions in the federal states and the governmental institution (BSA “Bundessortenamt”).
A system to optimize forage crop variety trials.....

⇒ General principles for all crops

First Splitting up Germany into crop unspecific areas defined by soil and climate characteristics

(german: “Boden-Klima-Raum”)

A system to optimize forage crop variety trials.....

⇒ **General principles for all crops** ⇒ specific adapted

Then building up Germany into crop specific areas (“producing areas”) by merging the unspecific areas

- one map for each cereal
- 7 maps for Oil and protein crops (winter rape, sunflower, field peas, faba beans, soja beans, blue lupin and flax)
- maize
- potatoes
- grassland
Crop specific implementation for Grassland - “producing areas” -

44 – (47) „soil-climate-areas“

12 (15) „producing areas“
Crop specific implementation for Grassland
- Optimizing costs to the core mandate -

Year of sowing the VCU-test

Number of candidates, varieties accepted

VCU-candidates
varieties accepted

Data: BSA

Hartmann 2010
Crop specific implementation for Grassland
- Optimizing costs to the core mandate -

Details of this aspect are published in:
Hartmann, S. and Hochberg, H., (2007)
A new system of forage crop variety trials in Germany;
Proceedings of the International Symposium ‘
Agricultural Field Trials – Today and Tomorrow’
October 8th to 10th, 2007,
Stuttgart, Germany,
ISBN 978-3-86186-541-4, 52-55

* by an arrangement with the LDS; partly varieties in the set of governmental advice
Crop specific implementation for Grassland
- “producing areas” -

Better sites, northwest
Better sites, Southwest
Lowlands, northeast (incl.)
Sandy soils, northeast, drought
Sandy soils, northwest, drought
Sites with drought in summer
Uplands in the middle of Germany
Uplands in southern of Germany
Mountain region of west Germany
Mountain region of east Germany
Prealpine region
Alps

state group
“middle-south”
(producing areas 7 to 12)
Bavaria, Saxonia, Thuringia, Baden-Württemberg, [Saxony-Anhalt, Hesse, parts of North Rhine-Westphalia]
Crop specific implementation for Grassland “producing areas” and sites of “middle-south” for perennial ryegrass

Hartmann 2010
new statistical analysis shows big regional differences in variety performance.
new statistical methods: closing the gap between requirement and reality

correlation between production areas

<table>
<thead>
<tr>
<th>production area</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
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<tbody>
<tr>
<td>6</td>
<td>0.244</td>
<td>0.324</td>
<td>0.155</td>
<td>0.345</td>
<td>0.287</td>
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<tr>
<td>7</td>
<td>0.244</td>
<td>0.529</td>
<td>0.253</td>
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<tr>
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<td>9</td>
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<td>0.357</td>
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<tr>
<td>10</td>
<td>0.345</td>
<td>0.562</td>
<td>0.746</td>
<td>0.357</td>
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<tr>
<td>11</td>
<td>0.287</td>
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<td>0.620</td>
<td>0.297</td>
<td>0.660</td>
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</table>

<table>
<thead>
<tr>
<th>sites:</th>
<th>1</th>
<th>3</th>
<th>2</th>
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<tr>
<td>production area</td>
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<tr>
<td>supplemental production area</td>
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</tr>
<tr>
<td>main production area</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| equivalents: | 1 | 2,238 | 1,240 | = 4,478 |

6 Sites with drought in summer
7 Uplands in the middle of g.
8 Uplands in southern of g.
9 Mountain region of west g.
10 Mountain region of east g.
11 Prealpine region

Hartmann 2009
new statistical methods:
closing the gap between requirement and reality

<table>
<thead>
<tr>
<th>production area</th>
<th>(equivalent) sites per production area</th>
<th>„Hohenheim-Gülzower Serienauswertung“</th>
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<tr>
<td>until 2006</td>
<td></td>
<td></td>
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<tr>
<td>Sites with drought in summer</td>
<td>1</td>
<td>1,56</td>
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<tr>
<td>Uplands in the middle of Germany</td>
<td>1</td>
<td>2,03 (1 site cancelled in target area)</td>
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<tr>
<td>Uplands in southern of Germany</td>
<td>1</td>
<td>4,48</td>
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<tr>
<td>Mountain region of west germany</td>
<td>1</td>
<td>2,32</td>
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<tr>
<td>Mountain region of east germany</td>
<td>3</td>
<td>5,63</td>
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<tr>
<td>Prealpine region</td>
<td>2</td>
<td>4,60</td>
</tr>
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</table>

Hartmann 2010
But always keep in mind: dry-matter yield is only one part of recommendation

<table>
<thead>
<tr>
<th>Yield</th>
<th>Persistence</th>
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</thead>
<tbody>
<tr>
<td>WP 6 middle – south ¹)</td>
<td>SFG/WP 3 middle – south ¹)</td>
</tr>
<tr>
<td>LSV 10 middle – south ²)</td>
<td>SV 5 Bavaria ²)</td>
</tr>
</tbody>
</table>

**Variety profiles**
- Increasingly different
- Permanent ↔ forage grassland

**Resistence**
- WP specific trials ¹) 4 BRD
- + alle resistence data from WP, LSV und SV

**Quality**
- Up to now special trials
- In near future NIRS

¹) „major“ species sown every year; „minor“ every third year
²) „major“ species sown in even years; „minor“ every third year

LfL Pflanzenbau

Hartmann 2010
Thank you for your kind attention!

The Core Team “Middle - South”:

Baden-Württemberg:
⇒ Nussbaum, H.-J., Wurth, W.

Bavaria
⇒ Hartmann, St., Probst, M., Schmidt, M., Warthun, U.

Saxonia
⇒ Riehl, G., Steffen, E.

Thuringia
⇒ Hegner, H., Hochberg, H.

Data also from: Hesse, North Rhine-Westphalia, Rhineland-Palatinate and Saxony-Anhalt