The design of sustainable cropping systems based on cover plants requires to choose the best cover plants to deliver a set of services. Tools and methods to assess the potential of plants to deliver these services barely exist. Trait-based approaches, originally developed in the field of comparative functional ecology (Violle 2007, Garnier and Navas 2012), have a strong potential to address these issues.

**A trait-based method to choose the best cover plant**

**Based on 5 steps**

1. **Analyse of the system** : separations, bio-physical constraints, services expected
2. **Identification of service-functions-trait relationships and trait thresholds**
3. **Trait-based characterisation of species** : Construction of functional profiles
4. **Identification of usages of cover plants** and ideotypes of functional profiles
5. **Choice of the best species**

**Materials and Methods**

- Two cover plants tested (for the 2 usages: ICC and CZ for usage A; AP and PN for usage B)
- Calculation of global values for the delivery of the services as the mean of the sums of the level of satisfaction of the functions
- Field assessment of the services actually delivered and calculation of synthetized indicators of the services

**Results**

- The globally consistent comparison of the trait-based characterization and field assessment of the services delivered encourages its further uses as a tool to choose species the best adapted to a set of expected services.

**Conclusion**

- Functional traits and cropping system design A trait-based characterization as a tool to choose the best coverplants according to a set of services

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**Figure 2**: SPAD readings of banana leaves during the first cycle of the banana

**Table 2**: Comparison between the global score resulting from the functions and the one of the trait-based characterization of species

<table>
<thead>
<tr>
<th>Usage</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICC</td>
<td>0.87</td>
<td>0.68</td>
</tr>
<tr>
<td>CZ</td>
<td>0.67</td>
<td>0.66</td>
</tr>
<tr>
<td>AP</td>
<td>0.52</td>
<td>0.54</td>
</tr>
<tr>
<td>PN</td>
<td>0.75</td>
<td>0.72</td>
</tr>
</tbody>
</table>

**Table 2**

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**Figure 2**: Distribution of functional profiles in the first cycle of the banana

**Figure 1**: Banana cropping system

**Figure 3**: Functional profiles of cover plants

**Figure 4**: Identification of functional profiles for two usages

**Figure 5**: Results