## Sprint Review

# Tables All The Way Down

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# Tables in a PDF

- Often data is found in tables in a PDF
- That data wants to be free, but needs your help

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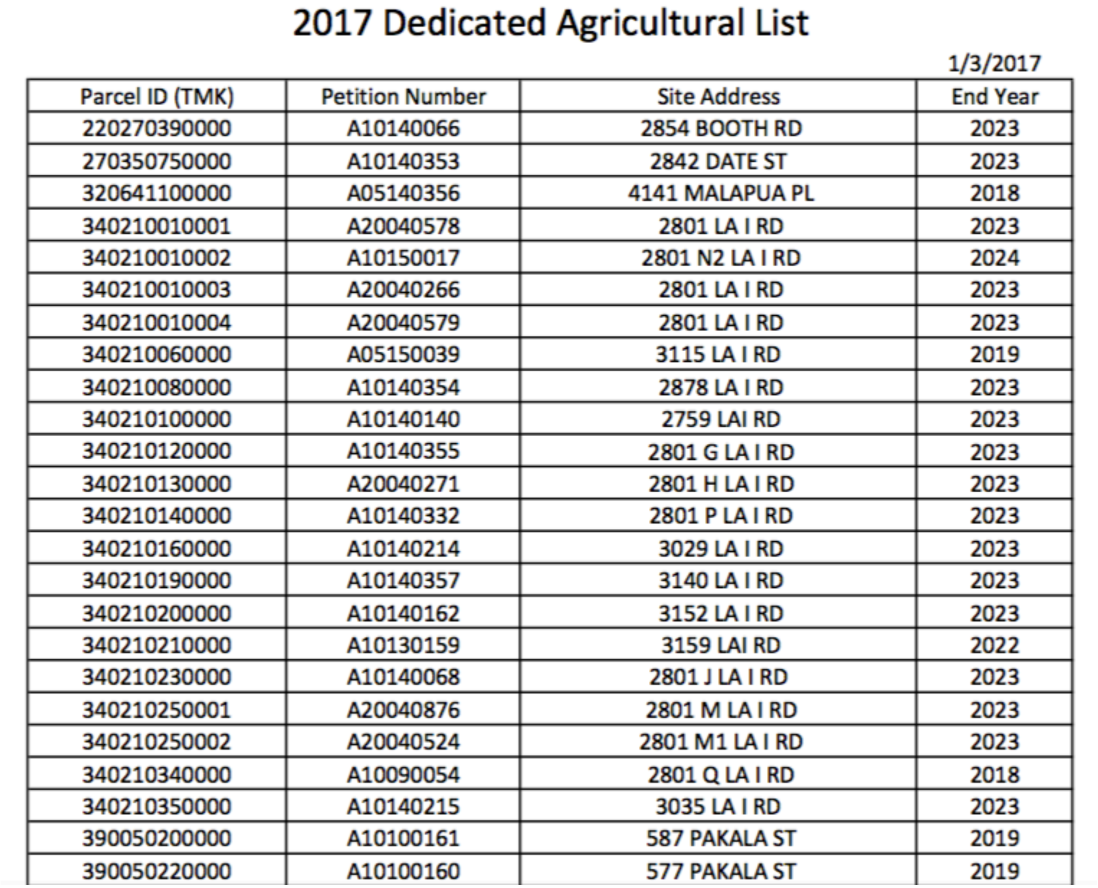

2017 Dedicated Agricultural List

1/3/2017

| Parcel ID (TMK) | Petition Number | Site Address | End Year |
|---|---|---|---|
| 220270390000 | A10140066 | 2854 BOOTH RD | 2023 |
| 270350750000 | A10140353 | 2842 DATE ST | 2023 |
| 320641100000 | A05140356 | 4141 MALAPUA PL | 2018 |
| 340210010001 | A20040578 | 2801 LA I RD | 2023 |
| 340210010002 | A10150017 | 2801 N2 LA I RD | 2024 |
| 340210010003 | A20040266 | 2801 LA I RD | 2023 |
| 340210010004 | A20040579 | 2801 LA I RD | 2023 |
| 340210060000 | A05150039 | 3115 LA I RD | 2019 |
| 340210080000 | A10140354 | 2878 LA I RD | 2023 |
| 340210100000 | A10140140 | 2759 LAI RD | 2023 |
| 340210120000 | A10140355 | 2801 G LA I RD | 2023 |
| 340210130000 | A20040271 | 2801 H LA I RD | 2023 |
| 340210140000 | A10140332 | 2801 P LA I RD | 2023 |
| 340210160000 | A10140214 | 3029 LA I RD | 2023 |
| 340210190000 | A10140357 | 3140 LA I RD | 2023 |
| 340210200000 | A10140162 | 3152 LA I RD | 2023 |
| 340210210000 | A10130159 | 3159 LAI RD | 2022 |
| 340210230000 | A10140068 | 2801 J LA I RD | 2023 |
| 340210250001 | A20040876 | 2801 M LA I RD | 2023 |
| 340210250002 | A20040524 | 2801 M1 LA I RD | 2023 |
| 340210340000 | A10090054 | 2801 Q LA I RD | 2018 |
| 340210350000 | A10140215 | 3035 LA I RD | 2023 |
| 390050200000 | A10100161 | 587 PAKALA ST | 2019 |
| 390050220000 | A10100160 | 577 PAKALA ST | 2019 |

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# Tables in a PDF

- There are various means to extract those tables:
- Applications, Web apps, R packages, etc.,
- They will often have different outputs (one vs multiple tables)

TABULA
liberate data tables trapped inside PDFs

PDFTables

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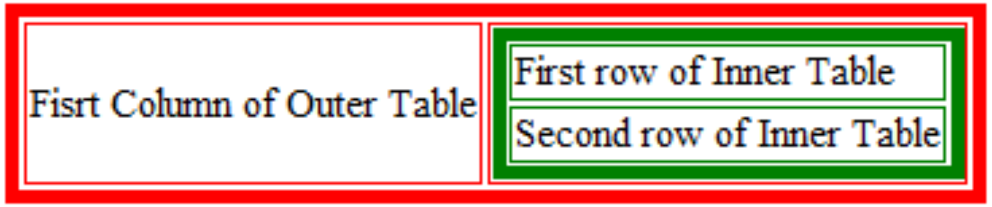
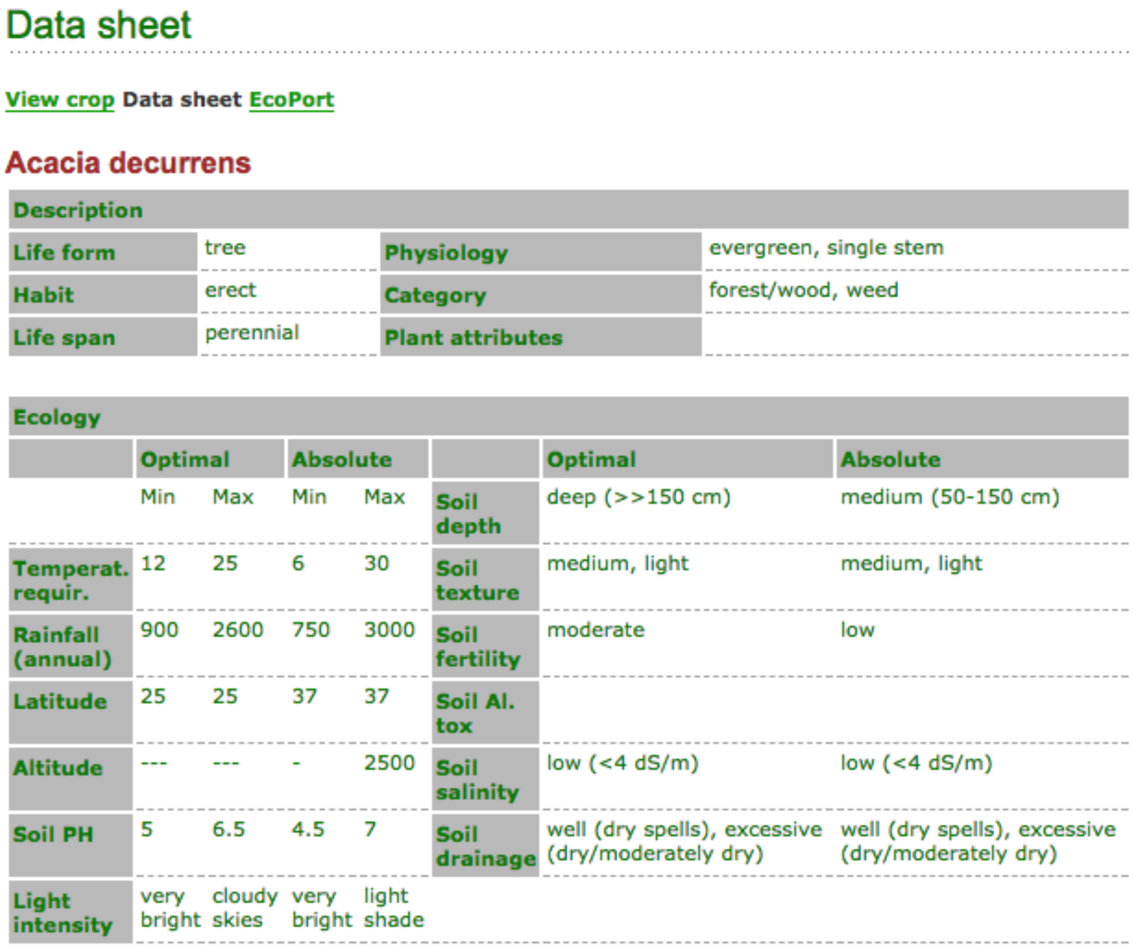
# Tables in HTML

- **<tables> are also found in HTML code**
- Sometimes handily notated, often not
- You can even have tables inside tables



| | |
|---|---|
| Fisrt Column of Outer Table | First row of Inner Table<br>Second row of Inner Table |



## Data sheet

View crop Data sheet EcoPort

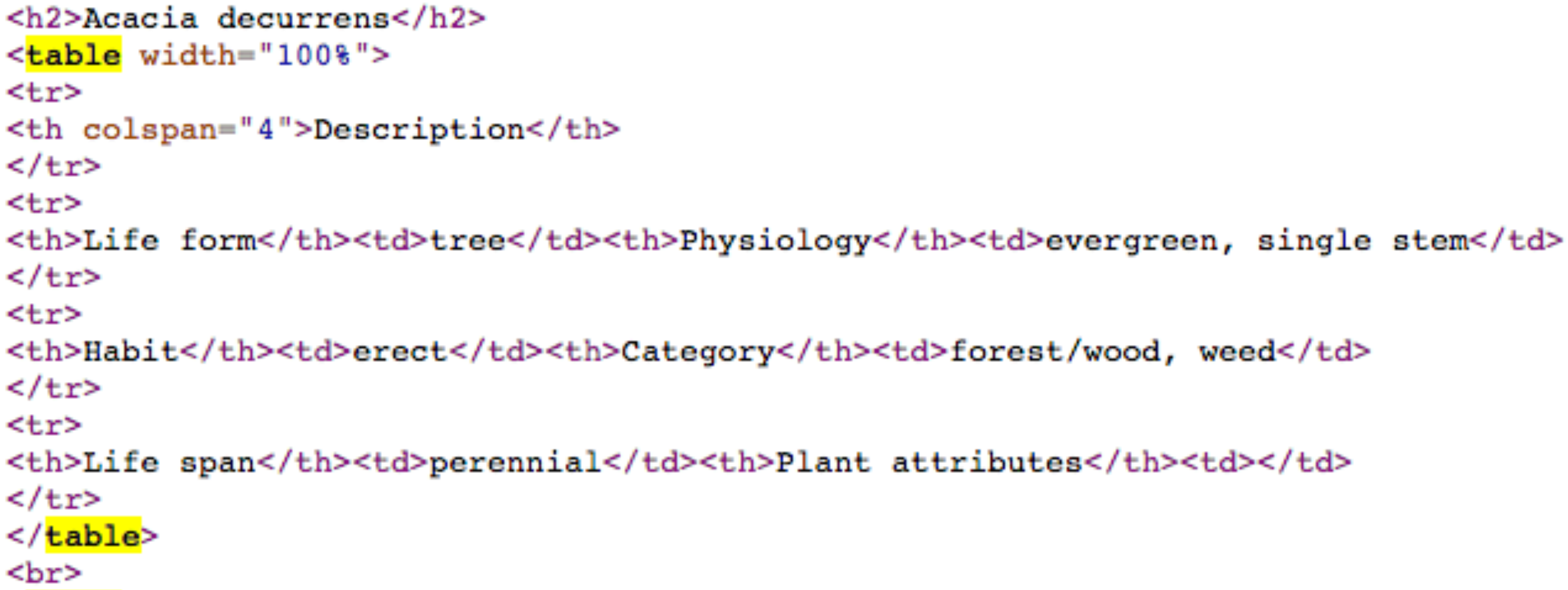
### Acacia decurrens

| Description | | | |
|---|---|---|---|
| Life form | tree | Physiology | evergreen, single stem |
| Habit | erect | Category | forest/wood, weed |
| Life span | perennial | Plant attributes | |

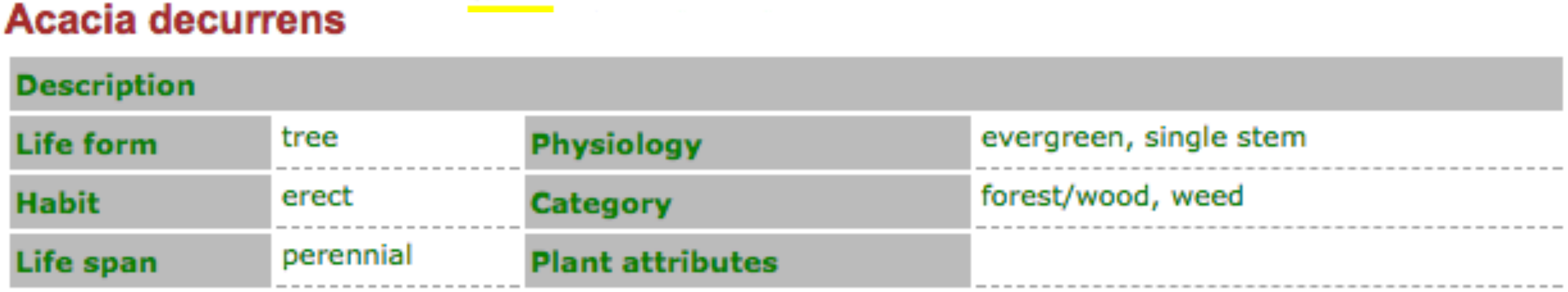
| Ecology | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Optimal | | Absolute | | | Optimal | Absolute |
| | Min | Max | Min | Max | Soil depth | deep (>>150 cm) | medium (50-150 cm) |
| Temperat. requir. | 12 | 25 | 6 | 30 | Soil texture | medium, light | medium, light |
| Rainfall (annual) | 900 | 2600 | 750 | 3000 | Soil fertility | moderate | low |
| Latitude | 25 | 25 | 37 | 37 | Soil Al. tox | | |
| Altitude | --- | --- | - | 2500 | Soil salinity | low (<4 dS/m) | low (<4 dS/m) |
| Soil PH | 5 | 6.5 | 4.5 | 7 | Soil drainage | well (dry spells), excessive (dry/moderately dry) | well (dry spells), excessive (dry/moderately dry) |
| Light intensity | very bright | cloudy skies | very bright | light shade | | | |

# Tables in HTML

- **<tables> are also found in HTML code**



```
<h2>Acacia decurrens</h2>
<table width="100%">
<tr>
<th colspan="4">Description</th>
</tr>
<tr>
<th>Life form</th><td>tree</td><th>Physiology</th><td>evergreen, single stem</td>
</tr>
<tr>
<th>Habit</th><td>erect</td><th>Category</th><td>forest/wood, weed</td>
</tr>
<tr>
<th>Life span</th><td>perennial</td><th>Plant attributes</th><td></td>
</tr>
</table>
<br>
```

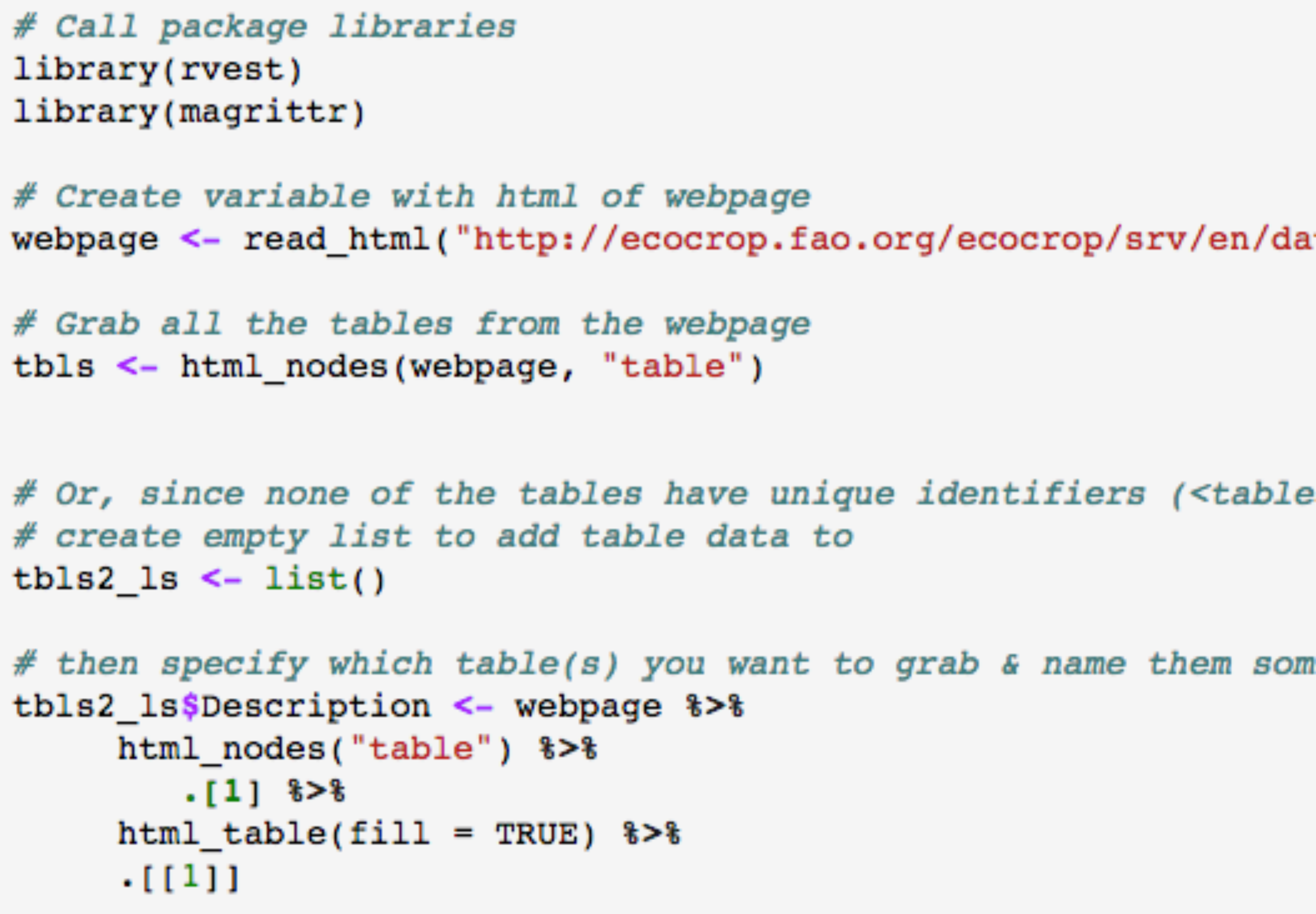


## Acacia decurrens

| Description | | | |
|---|---|---|---|
| **Life form** | tree | **Physiology** | evergreen, single stem |
| **Habit** | erect | **Category** | forest/wood, weed |
| **Life span** | perennial | **Plant attributes** | |

# Tables in HTML

- **Webscraping can help extract from html tables**
- rvest is a good package for this



```
# Call package libraries
library(rvest)
library(magrittr)

# Create variable with html of webpage
webpage <- read_html("http://ecocrop.fao.org/ecocrop/srv/en/da

# Grab all the tables from the webpage
tbls <- html_nodes(webpage, "table")


# Or, since none of the tables have unique identifiers (<table
# create empty list to add table data to
tbls2_ls <- list()

# then specify which table(s) you want to grab & name them som
tbls2_ls$Description <- webpage %>%
     html_nodes("table") %>%
        .[1] %>%
     html_table(fill = TRUE) %>%
     .[[1]]
```

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# Tables in R

- **SO MANY KINDS OF DATA:**
- Vectors. a <- c(1,2,5.3,6,-2,4) # numeric vector. ...
- Matrices. All columns in a matrix must have the same mode(numeric, character, etc.) ...
- Arrays. ...
- Data Frames. ...
- Lists. ...
- Factors. ...
- Data Frames

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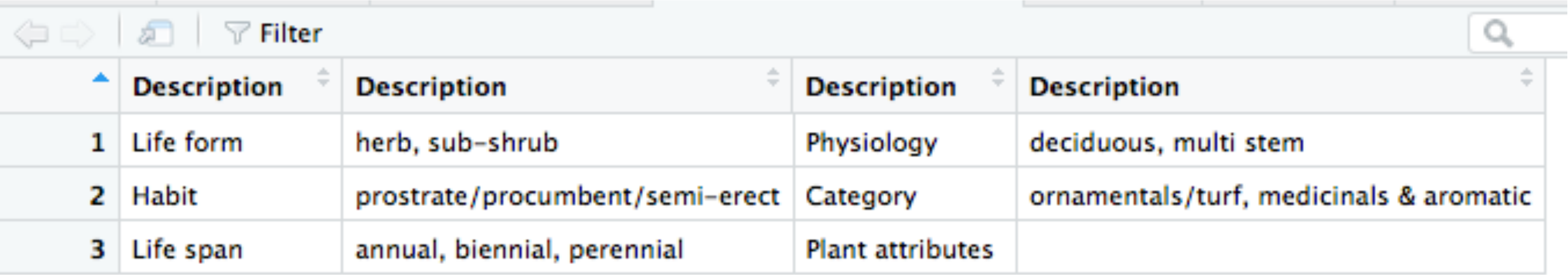
# Tables in R

- Scraped html tables can be stored as various data types in R
- Getting them to compile into a single table require unknowable volumes of magic



| | Description | Description | Description | Description |
|---|---|---|---|---|
| 1 | Life form | herb, sub-shrub | Physiology | deciduous, multi stem |
| 2 | Habit | prostrate/procumbent/semi-erect | Category | ornamentals/turf, medicinals & aromatic |
| 3 | Life span | annual, biennial, perennial | Plant attributes | |

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# In Summary

- Damn near everything can be rendered into a table format, including tables
- Tables are everywhere
- You might be a table
- If not, R can help you wish you were

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# Pau

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