Manual Statistical Application - Proefcentrum Hoogstraten

Dieter Baets

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Introduction

Proefcentrum Hoogstraten vzw. (Belgium) is a research company specialized in greenhouse field trials and practical research for three crops: strawberry, sweet pepper and tomato. In order to ensure the quality of the research conclusions and repeatability a standardised statistical analysis tool was developed as a R-Shiny web application. With this Shiny application researchers of Proefcentrum Hoogstraten are able to perform frequently used analysis on their data.

This manual helps researchers to use the application as intended. For further questions or inquiries please contact me directly dieterbaets(at)gmail(dot)com or dieter(dot)baets(at)proefcentrum(dot)be.

Install requirements

Before running the Shiny application on your own machine please ensure following prerequisites:

- at least R-version 4.0.0 (Arbor Day) or higher
- at least RStudio 1.2.5033 (Orange Blossom) or higher

First install the correct R-version on your own machine befor installing R-Studio. This ensures that alle R-related documents are recognised by RStudio as an IDE. After installing the software download the code on the github repo (github.com/dbaets/PCH_StatisticalApplicaton). Unzip the code in a folder of your own choosing, best to keep it on your own c:// harddrive for example under documents. Look for install folder and open the *install.Rproj* file. In this R project open the *R_installpackages.R* file and run the script by selecting the entire code and clicking on *Run* in the right top corner of the scripts pane. Wait untill all necessairy applicatons are installed.

Running Shiny application

After installing all the required packages you can now run the shiny application. Open the *statisticalapp* folder and open the *PCH_statisticalApplication.Rproj* file. By doing so you are ensuring that all necessairy scripts for the application are located in the right place so the app can run smoothly. Open the *app.R* file and click on **Run App** in the right upper corner of the scripting pane. If all goes well you are now officially running the *PCH - Statistical application* and you can perform the necessary statistial analasys.

Performing statistical analysis using statistical application

Preparing data

In order to perform any analys using the *PCH - statistical application* you need to put the data in to the correct format otherwise the shiny app cannot load the data and will throw an error. Please download the correct template f

Loading data

First select a input file using the **Select file** button and select an input type using the radiobuttons on the *Input* pane before loading the file using the **Load file** button.

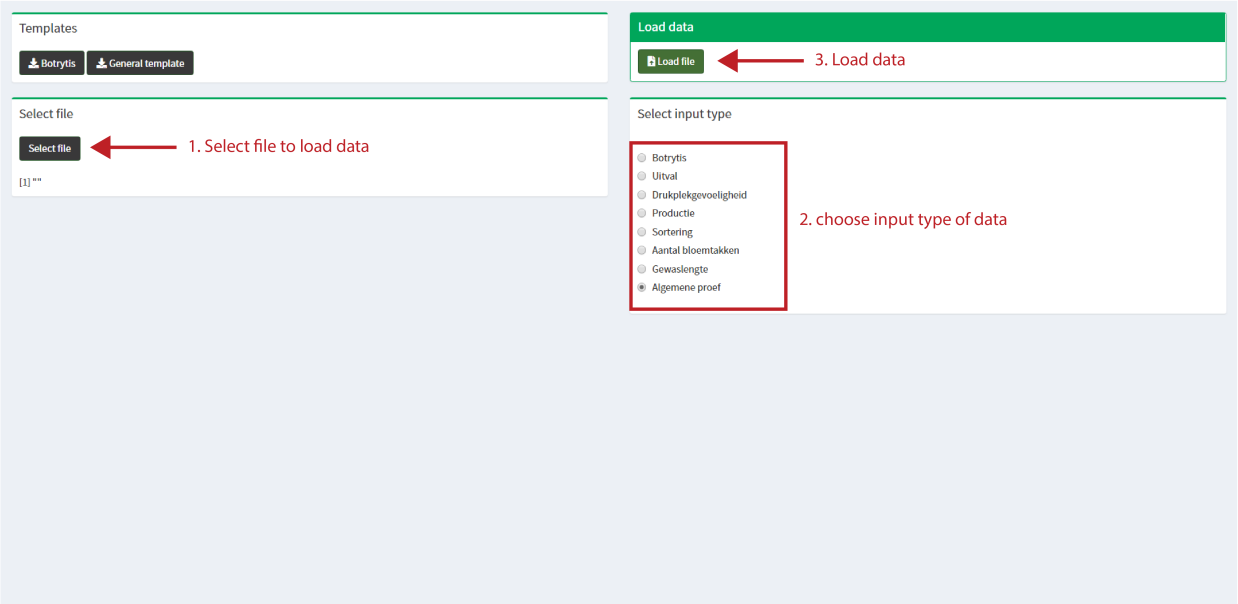


Figure 1: Input pane to load data for analysis

Running analysis

When de data is loaded correctly in to the application you are automatically taken to the next pane called *statistics*. On this pane you only have to press the green button *Run Statistics*. If everything goes well you are redirected to the *output* pane where you can download the results using the green *Output Results button*. The output excel is redirected to the same folder were you loaded the inputdata from.

Interpreting output

output file

following tabs are generated in the outputfile:

- **inputdata**: the inputdata used to perform the analysis
- **teststatistic**: summary of the test statistic used to differentiate between different objects. The app chooses automatically between parametric and non parametric tests according to the prerequisites for each tests.
- **sigletters**: if the p-value of the test statistic is <0.05 you can interpret the results using a post-hoc test. For each object a letter or p-value is placed in a table with the summary statistics. If the letters are different from each other the different objects are different from each other.
- **summary**: table with a summary of the data. This summary is ideal to make graphs from.

reporting results

todo

Types of inputdata

Botrytis

excelsheetname: *statistiek*

	A	B	C	D	E	F	G	H	I	J	K
1	datum	objectnr	objectnaam	herhaling	aantal_stuks	aantasting_geen	aantasting_25	aantasting_50	aantasting_75	aantasting_100	
2	datum1	1	Murano	1	52	49	2	0	0	1	
3	datum1	1	Murano	2	52	50	1	0	0	1	
4	datum1	1	Murano	3	52	47	2	1	1	1	
5	datum1	1	Murano	4	52	48	2	2	0	0	
6	datum1	2	Verity	1	49	45	4	0	0	0	
7	datum1	2	Verity	2	51	45	3	2	1	0	
8	datum1	2	Verity	3	39	37	2	0	0	0	
9	datum1	2	Verity	4	52	50	1	0	1	0	
10	datum1	3	M. Champio	1	34	31	1	1	1	0	
11	datum1	3	M. Champio	2	23	21	0	0	1	1	
12	datum1	3	M. Champio	3	10	8	2	0	0	0	
13	datum1	3	M. Champio	4	35	34	0	0	1	0	
14	datum1	4	08-06-10	1	52	48	1	0	3	0	
15	datum1	4	08-06-10	2	52	49	2	0	0	1	
16	datum1	4	08-06-10	3	52	51	1	0	0	0	
17	datum1	4	08-06-10	4	52	50	1	0	1	0	
18	datum1	5	CIV 621	1	52	47	1	2	2	0	
19	datum1	5	CIV 621	2	52	51	1	0	0	0	
20	datum1	5	CIV 621	3	52	46	3	1	1	1	
21	datum1	5	CIV 621	4	52	49	1	1	1	0	
22	datum2	1	Murano	1	52	43	8	0	1	0	
23	datum3	1	Murano	2	52	42	7	2	1	0	
24	datum4	1	Murano	3	52	47	4	0	1	0	
25	datum5	1	Murano	4	52	44	4	2	2	0	
26	datum6	2	Verity	1	52	45	3	2	2	0	
27	datum7	2	Verity	2	52	48	3	1	0	0	
28	datum8	2	Verity	3	52	48	2	1	1	0	
29	datum9	2	Verity	4	52	47	4	1	0	0	
30	datum10	3	M. Champio	1	52	51	1	0	0	0	
31	datum11	3	M. Champio	2	52	46	4	1	1	0	
32	datum12	3	M. Champio	3	52	48	0	2	2	0	
33	datum13	3	M. Champio	4	52	44	5	0	3	0	

FAB_4 | samenvatting | Datum 1 | Datum 2 | Datum 3 | Totaal | Blad1 | statistiek

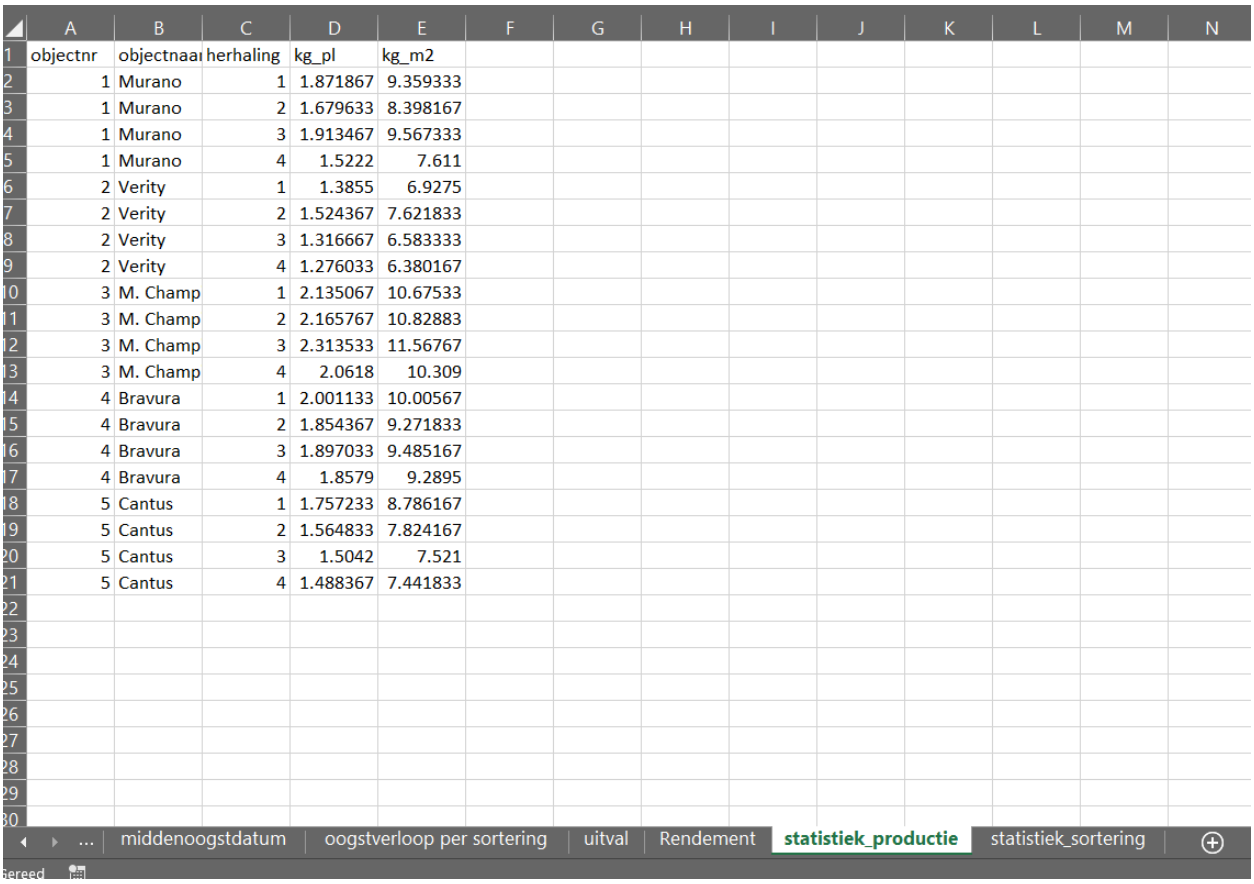
Figure 2: botrytis

productie

excelsheetname: *statistiek_productie*

sortering

excelsheetname: *statistiek_sortering*



	A	B	C	D	E
1	objectnr	objectnaa	herhaling	kg_pl	kg_m2
2	1	Murano	1	1.871867	9.359333
3	1	Murano	2	1.679633	8.398167
4	1	Murano	3	1.913467	9.567333
5	1	Murano	4	1.5222	7.611
6	2	Verity	1	1.3855	6.9275
7	2	Verity	2	1.524367	7.621833
8	2	Verity	3	1.316667	6.583333
9	2	Verity	4	1.276033	6.380167
10	3	M. Champ	1	2.135067	10.67533
11	3	M. Champ	2	2.165767	10.82883
12	3	M. Champ	3	2.313533	11.56767
13	3	M. Champ	4	2.0618	10.309
14	4	Bravura	1	2.001133	10.00567
15	4	Bravura	2	1.854367	9.271833
16	4	Bravura	3	1.897033	9.485167
17	4	Bravura	4	1.8579	9.2895
18	5	Cantus	1	1.757233	8.786167
19	5	Cantus	2	1.564833	7.824167
20	5	Cantus	3	1.5042	7.521
21	5	Cantus	4	1.488367	7.441833

Figure 3: productie

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	objectnr	objectnaa	herhaling	groot2A	grootA	klein	misvormd	rot					
2	1	Murano	1	5.101786	0.455357	4.282143	0.155893	0.032679					
3	1	Murano	2	4.444828	0.406897	3.660345	0.122241	0.053448					
4	1	Murano	3	5.005085	0.40339	4.145763	0.120678	0.054576					
5	1	Murano	4	4.203571	0.176786	3.553571	0.146786	0.073929					
6	2	Verity	1	4.381667	0.575	1.853333	0.106667	0.010833					
7	2	Verity	2	4.96	0.455	2.135	0.043167	0.028667					
8	2	Verity	3	3.905	0.543333	2.05	0.0775	0.0075					
9	2	Verity	4	4.136667	0.555	1.615	0.0605	0.013					
10	3	M. Champ	1	4.381667	0.771667	5.44	0.062	0.02					
11	3	M. Champ	2	3.875	0.786667	6.046667	0.100833	0.019667					
12	3	M. Champ	3	4.055	1.015	6.349667	0.102833	0.045167					
13	3	M. Champ	4	3.968421	0.696491	6.068421	0.03614	0.082105					
14	4	Bravura	1	5.96	0.96	2.91	0.154167	0.0215					
15	4	Bravura	2	5.248333	0.88	2.871667	0.1605	0.111333					
16	4	Bravura	3	5.601667	0.908333	2.841667	0.112833	0.020667					
17	4	Bravura	4	5.119167	1.13	2.941667	0.088833	0.009833					
18	5	Cantus	1	5.155	0.815	2.525	0.251667	0.0395					
19	5	Cantus	2	4.421667	0.798333	2.32	0.2355	0.048667					
20	5	Cantus	3	4.186667	0.765	2.323333	0.209667	0.036333					
21	5	Cantus	4	4.15	0.658621	2.567241	0.276379	0.046207					
22													
23													
24													
25													
26													
27													
28													
29													
30													

... | middenoogstdatum | oogstverloop per sortering | uitval | Rendement | statistiek_productie | **statistiek_sortering**

Figure 4: sortering