Visualization

Methods of Scientific Working for Crop Science (3502-440)

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1 Key concepts of visualization

- Data to ink ratio (Tufte)
- Glass slippers (Bergstrom and West: Calling Bullshit)
- Principle of proportional ink (Bergstrom and West: Calling Bullshit)

2 Discussion questions

Based on the chapter 7 *Data Visualization*, Calling Bullshit.

1. Why are concept maps such as the subway map and Venn diagrams susceptible to misuse?
2. What is the problem of **binning** data for visualization?
3. What needs to be considered when plotting data with two different y-axes?
4. Which arguments play a role when plotting absolute vs. relative values in different types of plots like bar plots, line plots.
   Think about the roles of:
   - Effect size
   - Sample size
   - Types of comparison

3 Some example plots

Discuss the following points:

- Key message and underlying visualization concept
- Advantage of concept
- Disadvantage of concept

3.1 Corona vaccinations and deaths in Europe

Source: `https://twitter.com/Vuckolino/status/1480570696275316739?s=20`

How could the plot improved or plotted differentially to identify countries that are outliers in the relationship between vaccination status and corona-related deaths?

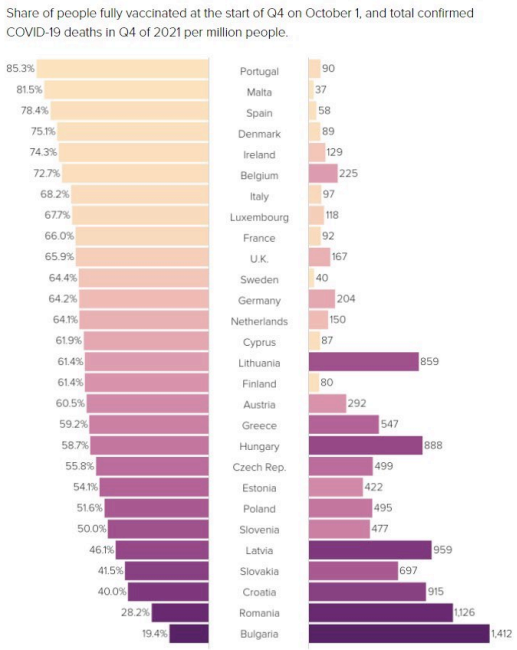

Figure 1: Comparison of vaccination status with corona deaths.

3.2 Gene families in different crops

Source: The banana (Musa acuminata) genome and the evolution of monocotyledonous plants. Angélique D'Hont, France Denoeud, et al. Nature (2012) `http://dx.doi.org/10.1038/nature11241` (published online July 11, 2012)

What are the key messages of this figure?

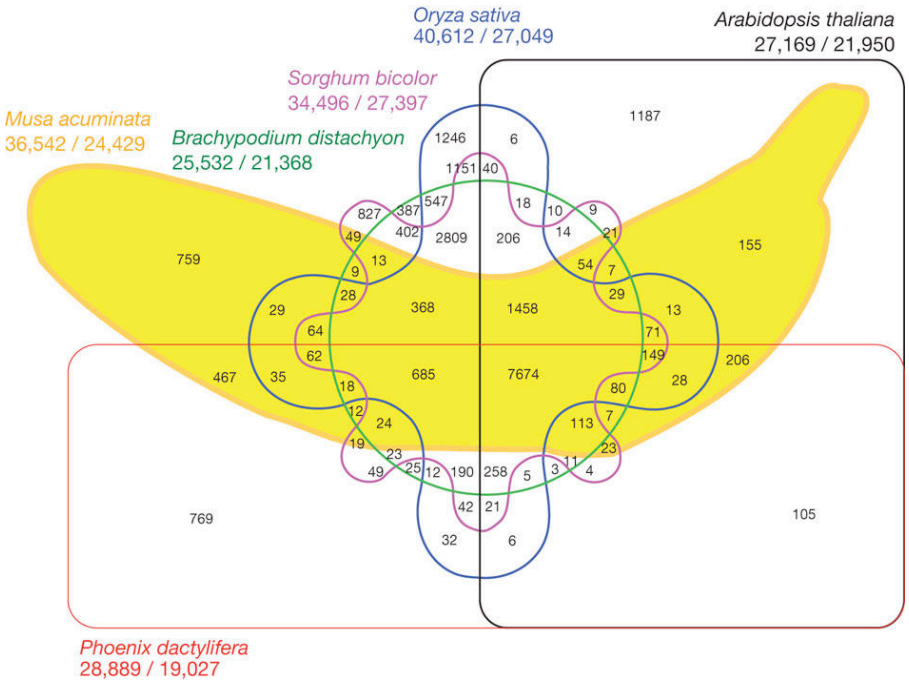

Figure 2: Six-way Venn diagram showing the distribution of shared gene families (sequence clusters) among M. acuminata, P. dactylifera, Arabidopsis thaliana, Oryza sativa, Sorghum bicolor and Brachypodium distachyon genomes.

3.3 Anthocyanin accumulation in strawberries

Source: Low temperature inhibits anthocyanin accumulation in strawberry fruit by activating FvMAPK3-induced phosphorylation of FvMYB10 and degradation of Chalcone Synthase 1 Wenwen Mao, Yu Han, Yating Chen, Mingzhu Sun, Qianqian Feng et al. The Plant Cell, koac006, `https://doi.org/10.1093/plcell/koac006` (2022)

Could the message be improved by a different type of graph?

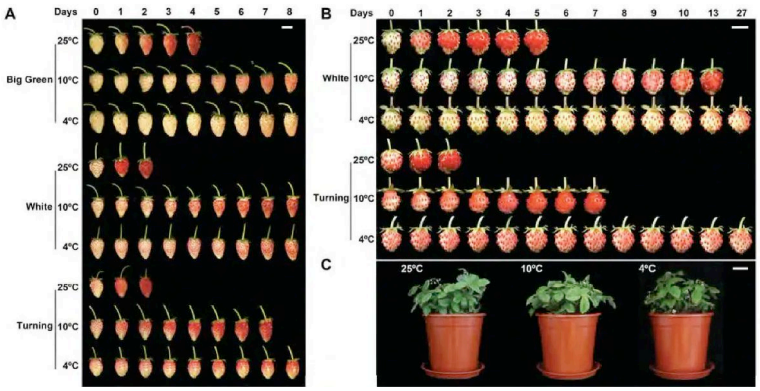

Figure 3: Low temperature inhibits anthocyanin accumulation in strawberry fruit by activating FvMAPK3-induced phosphorylation of FvMYB10 and degradation of Chalcone 1.