

Handling Field Experiment Data

Trace-ability
and standards



A B C

- Organising field experiments
- Components in the data chain
- Database structure and standard

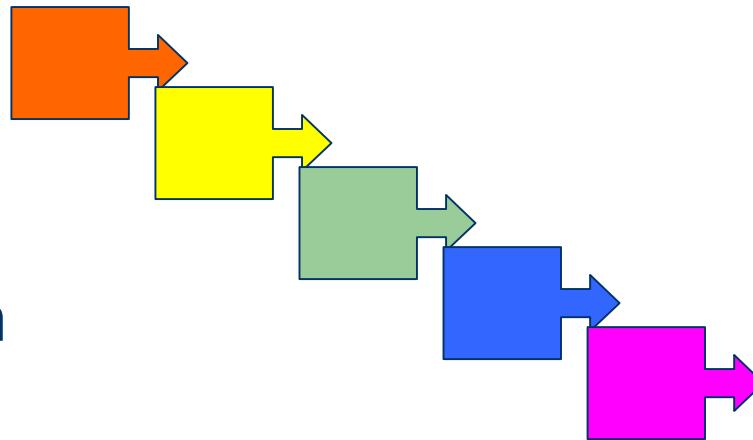
Organising Field Experiments

- Centralise/decentralise?
- Order-delivery organisation?
- Quality assurance system
- Information flow, direction
- Available resources
- Critical deadlines
- International cooperation



Components in the Data Chain

- Data collection
- Data storage
- Data analysis
- Data presentation
- Data retrieval



Quality assurance

- Clear responsibilities
- Educated personnel
- Dates & signatures
- Calibration records
- Change at origin
- Paper printouts
- Readable protocols



Data Collection

- 1- or 2-way data flow
- Handheld computers
- Standard pc:s
- Merging different data
- Alternate procedures
- Backup copies

Data Base Design

- Flat files/spreadsheet
- One file with all data
- One parameter/column
- Fits statistics packages
- Good for making graphs
- Information repeated
- Relational database
- Deep, narrow tables
- Update in one place only
- Unique table keys
- One-to-many relations
- Flexible, with standards

Examples of data tables

TRIALS (KEY TABLE)

TRIAL-ID	SERIES	LOCATION	YEAR
XEMPL	EXAMPLE	X-5-1992	1995
CROP	DISTRICT 1	DISTRICT 2	
WINTER WHEAT			
PRINCIPAL INVESTIGATOR			
JAMES FIELDER			
N:O OF BLOCKS, HARVESTS	ROTATION	YEAR	
2	1		
OTHER COMMENTS			
Just for demonstration purpose			

TRIAL	UARC CODE	PLOT	VALUE
XEMPL	Y	10	1,1159
XEMPL	Y	11	1,0342
XEMPL	Y	12	1,0233
XEMPL	Y	13	0,9717
XEMPL	Y	14	0,9301
XEMPL	Y	15	0,7154
XEMPL	Y	16	0,8294
XEMPL	Y.KG	1	12,0000
XEMPL	Y.KG	2	15,6800
XEMPL	Y.KG	3	14,0800
XEMPL	Y.KG	4	14,8800
XEMPL	Y.KG	5	11,0400
XEMPL	Y.KG	7	13,6000
XEMPL	Y.KG	8	15,3600
XFMP1	Y KG	9	14 4000

Data integrity

- Backup routines
- Retaining changed data
- Change only at origin
- Avoid distorted data
- Don't mix different data

Rounding, decimal char.:

-> Integer + Exponent

-> no thousand separator

123456E-3 = 123.456

Different date formats:

-> Julian day numbers

730301 = 11-7-2000

Data Coding Standards

- General coding rules
- Method descriptions
- Growth stages
- Crop varieties, pesticides
- Geographical co-ordinates
- Soil characterisation
- Quality assurance and standard procedures
- Composing treatments
- Use of SI units
- Normalise data, like dry matter yield per m²
- Rules for assessments
- Fractions, percentages

EPPPO/Bayer codes

- European/International system based on Latin names for crops, weeds, pests, insects etc.
- Crops/weeds has 3+2 characters, others 4+2

Example:

MATIN Matricaria inodora/scentless chamomile

MELIAE Meligethes aeneus/blossom beetle

Decimal Growth stages

- Extended BBCH decimal growth stages 0-100
 - General and crop-specific scales
 - Crop independent
 - What about mixed crops?
- | | |
|-------|-----------------------------------|
| 0-9 | Germination |
| 10-19 | Emergence, first leaves |
| 20-49 | Herbal leaves, roots, shoots etc. |
| 50-59 | Forming of buds |
| 60-69 | Flowering |
| 70-79 | Forming of fruits |
| 80-89 | Ripening |
| 90-99 | Withering |

Crop Varieties, Pesticides

Example, crop variety

Not officially approved:

mm ## (dd) [xxxx]

Approved/named product:

nnnn.mm (dd) [xxxx]

mm breeder's code

inofficial variety No.

dd reseller/dealer

xxxx optional codes like;
2X (diploid), GMO,...

Geographical co-ordinates

- World Geodetic System WGS84 and GPS instruments
- Latitude, longitude and height above reference ellipsoid
- North/South and East/West definitions
- Conversion to map/GIS system coordinates
- Internationally common system preferred

Soil Characterisation

- Many different systems
- Texture, humus, sorted/unsorted/organic?
- What is cultivated layer? 0-30 cm?

Example of syntax: hhtttaabb[tttaabb]

hh humus content

ttt soil type and homogeneity code

aa percent of sand, rounded to an integer, %

bb percent of silt, rounded to an integer, %

[...] optional set of parameters for the subsoil