Effect of small farms on crop production estimates

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2.10.2017 Pacioli-workshop

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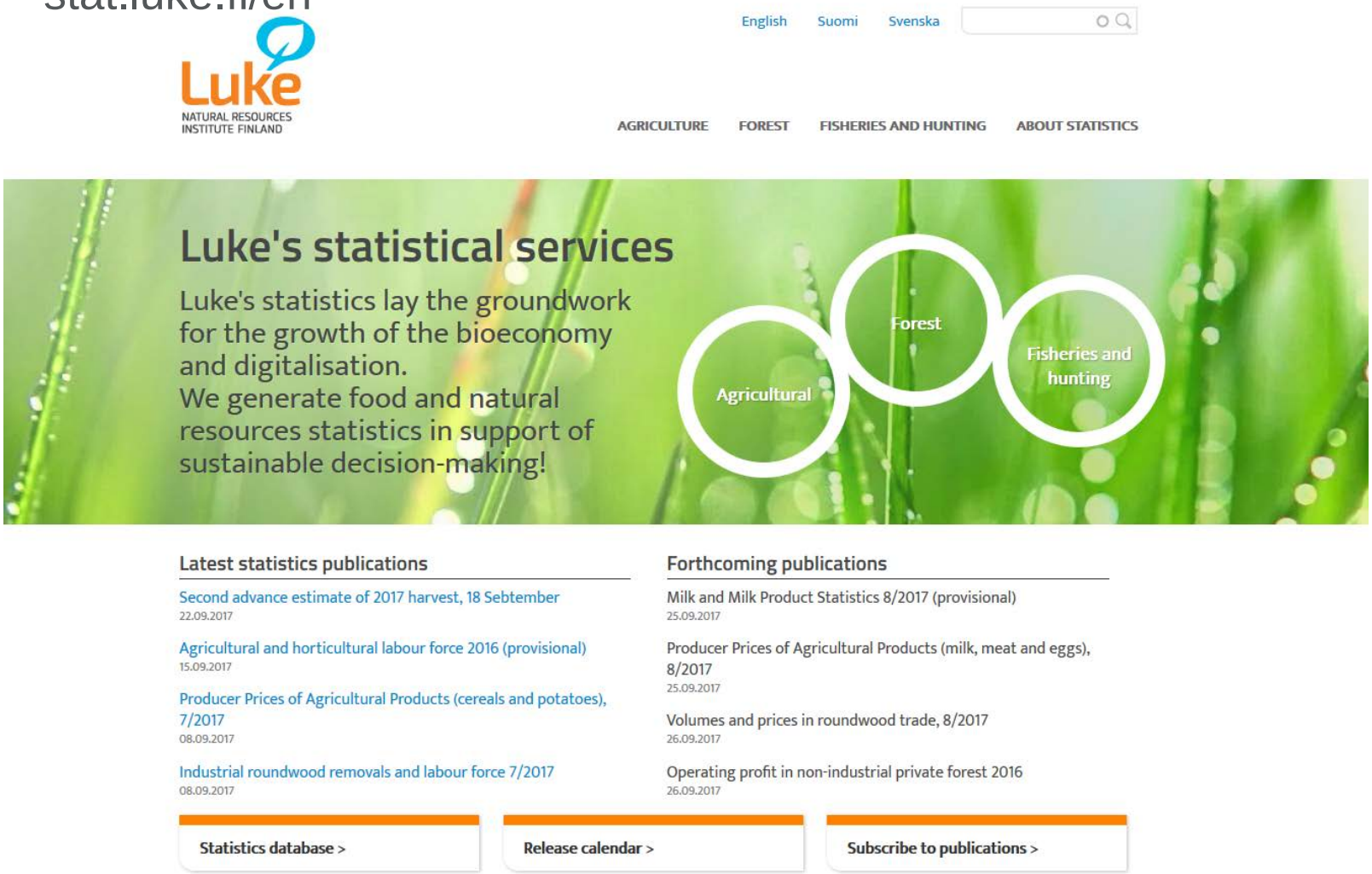
Background

stat.luke.fi/en



Background

stat.luke.fi/en/
crop-production-statistics

English Suomi Svenska

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AGRICULTURE FOREST FISHERIES AND HUNTING ABOUT STATISTICS

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Crop Production Statistics

Second advance estimate of 2017 harvest, 18 Sebtember

22.09.2017

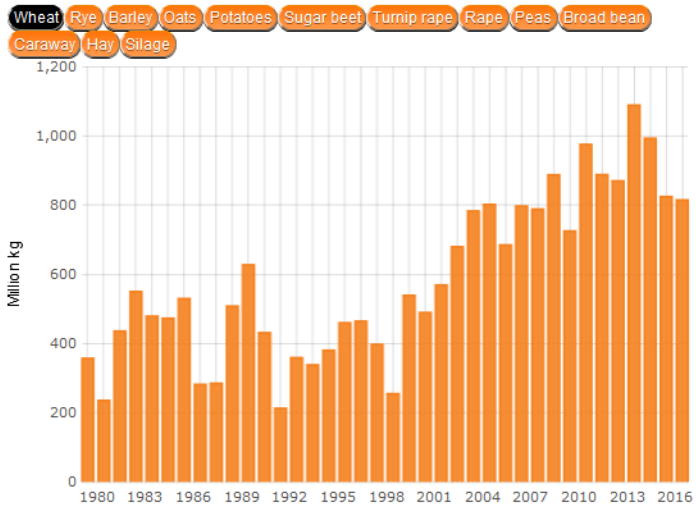
Headlines

Anticipated crops for 2017 in Finland, 18 September:

- Grain harvest total 3.5 million tons (-1%)
  - Barley 1.4 million tons (-10%)
  - Oats 1.1 million tons (+8%)
  - Wheat 0.8 million tons (-1%)
  - Rye 0.1 million tons (+34%)
- Turnip rape and rape total 107 000 tons (+16%)
- Potatoes 638 000 tons (+9%)
- Sugar beet 469 000 tons (+8%)
- Peas 29 000 tons (+16%)
- Broad bean 56 000 tons (+39%)

More detailed information about crop volumes will be obtained on 23 November when information is available from farms for the calculation of crop volumes.

Production of crops, 1980 - 2017e



Source: OSF: Natural Resources Institute Finland, Crop production statistics.

Grain harvest estimate to reach 3.5 million tons – even with harvesting still in progress (22.9.2017)

READ MORE

New releases

Second advance estimate of 2017 harvest, 18 Sebtember
22.09.2017

First advance estimate of 2017 harvest, 17 July
21.07.2017

Crop Production Statistics and the quality of the grain harvest 2016
23.02.2017

Crop Production Statistics and the quality of the grain harvest 2016, advance information
24.11.2016

Second advance estimate of 2016 harvest, 22 August
26.08.2016

VIEW ALL RELEASES

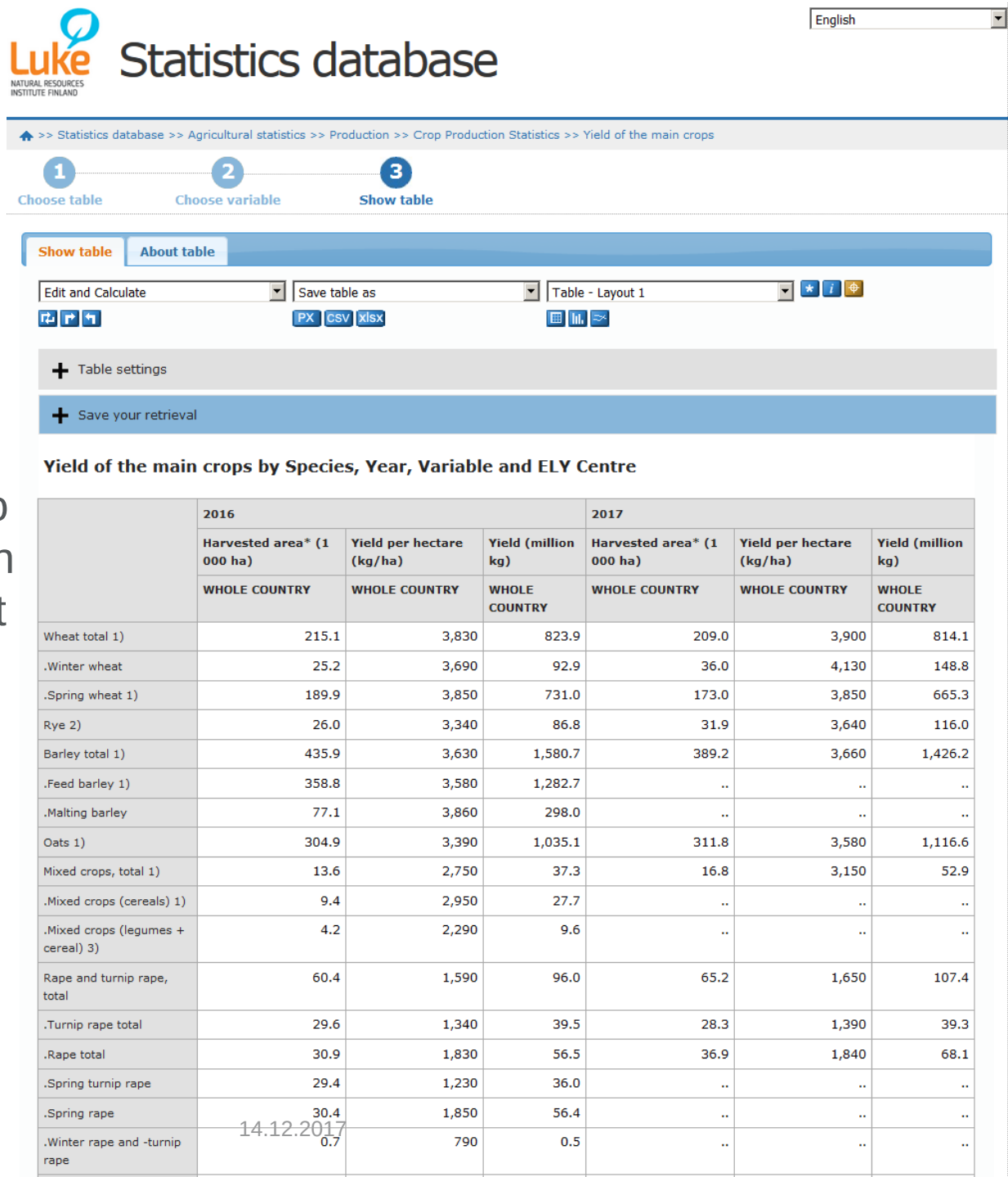
Description >

Statistics database >

Background

statdb.luke.fi

Key question:
Does it make sense to collect crop production data from the smallest farms?



Luke NATURAL RESOURCES INSTITUTE FINLAND Statistics database

English

>> Statistics database >> Agricultural statistics >> Production >> Crop Production Statistics >> Yield of the main crops

1 Choose table 2 Choose variable 3 Show table

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PX CSV XLSX

+ Table settings

+ Save your retrieval

Yield of the main crops by Species, Year, Variable and ELY Centre

	2016			2017		
	Harvested area* (1 000 ha)	Yield per hectare (kg/ha)	Yield (million kg)	Harvested area* (1 000 ha)	Yield per hectare (kg/ha)	Yield (million kg)
	WHOLE COUNTRY	WHOLE COUNTRY	WHOLE COUNTRY	WHOLE COUNTRY	WHOLE COUNTRY	WHOLE COUNTRY
Wheat total 1)	215.1	3,830	823.9	209.0	3,900	814.1
.Winter wheat	25.2	3,690	92.9	36.0	4,130	148.8
.Spring wheat 1)	189.9	3,850	731.0	173.0	3,850	665.3
Rye 2)	26.0	3,340	86.8	31.9	3,640	116.0
Barley total 1)	435.9	3,630	1,580.7	389.2	3,660	1,426.2
.Feed barley 1)	358.8	3,580	1,282.7	..	..	..
.Malting barley	77.1	3,860	298.0	..	..	..
Oats 1)	304.9	3,390	1,035.1	311.8	3,580	1,116.6
Mixed crops, total 1)	13.6	2,750	37.3	16.8	3,150	52.9
.Mixed crops (cereals) 1)	9.4	2,950	27.7	..	..	..
.Mixed crops (legumes + cereal) 3)	4.2	2,290	9.6	..	..	..
Rape and turnip rape, total	60.4	1,590	96.0	65.2	1,650	107.4
.Turnip rape total	29.6	1,340	39.5	28.3	1,390	39.3
.Rape total	30.9	1,830	56.5	36.9	1,840	68.1
.Spring turnip rape	29.4	1,230	36.0	..	..	..
.Spring rape	30.4	1,850	56.4	..	..	..
.Winter rape and -turnip rape	0.7	790	0.5	..	..	..

Data for crop production statistics

- Official crop production statistics
- Annual sample of 6600 farms
- Data from 6000 non-organic farms used in this work
- Stratified sample
  - 6 size classes, 8 types of production, 16 areas
- 40 crops
- Farm-level information collected
  - Harvested area
  - Total yield
- Some crops are grown by only few farms in the sample

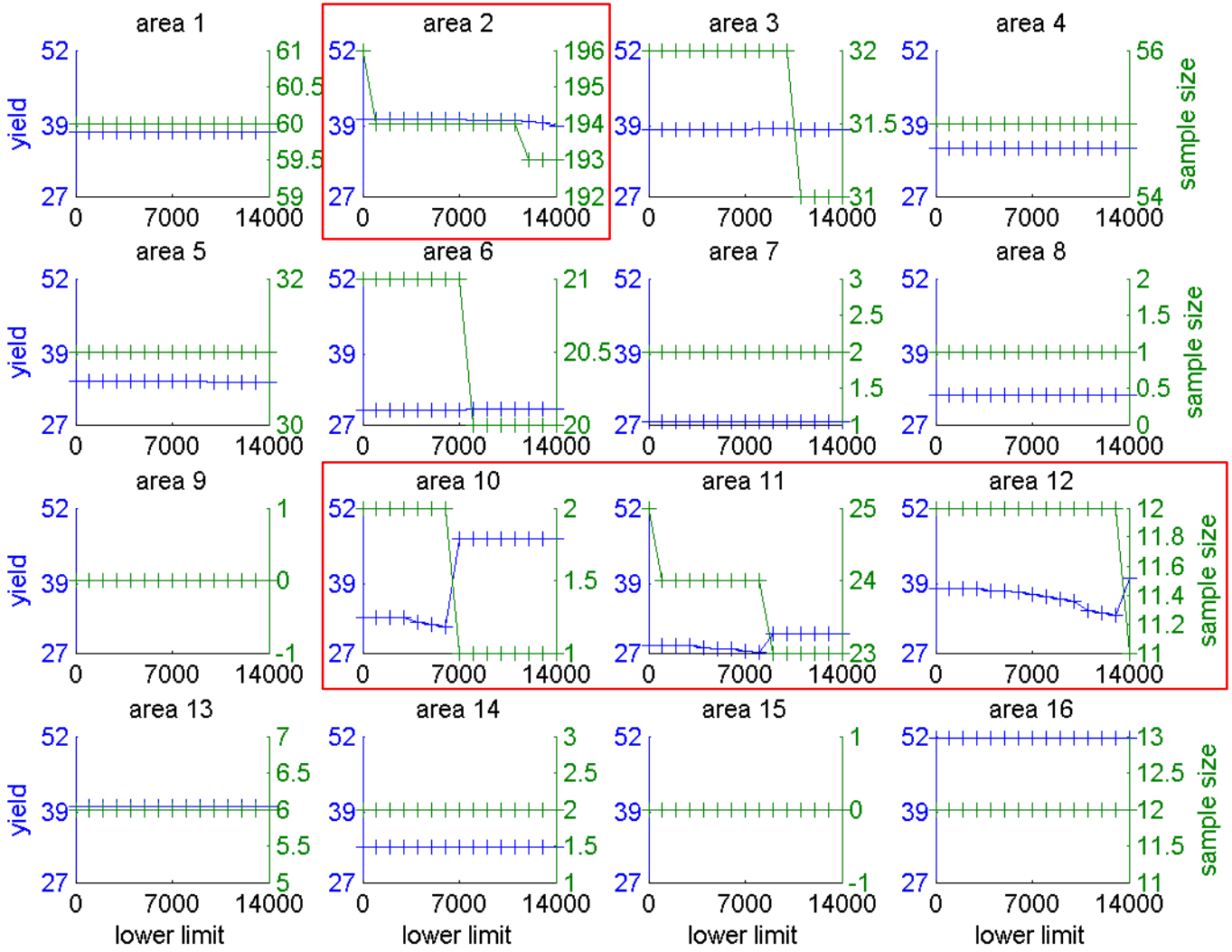
Method for estimating effect of small farms

- SO farm size limit is used to define a small farm
- Set a lower limit for farm to be included in the sample
- Limit: 1000, 2000, …, 13000, 14000 €
- Recalculate sample weight after applying each size limit
- Above 3000 € change stratification
  - combine smallest size classes: 0-3999 and 4000-14999
- Calculate estimate of yield per hectare

$$\frac{\sum_i w_i y_i}{\sum_i w_i a_i}$$

- i = farm index, w = weight, y = total yield, a = area

Results: winter wheat



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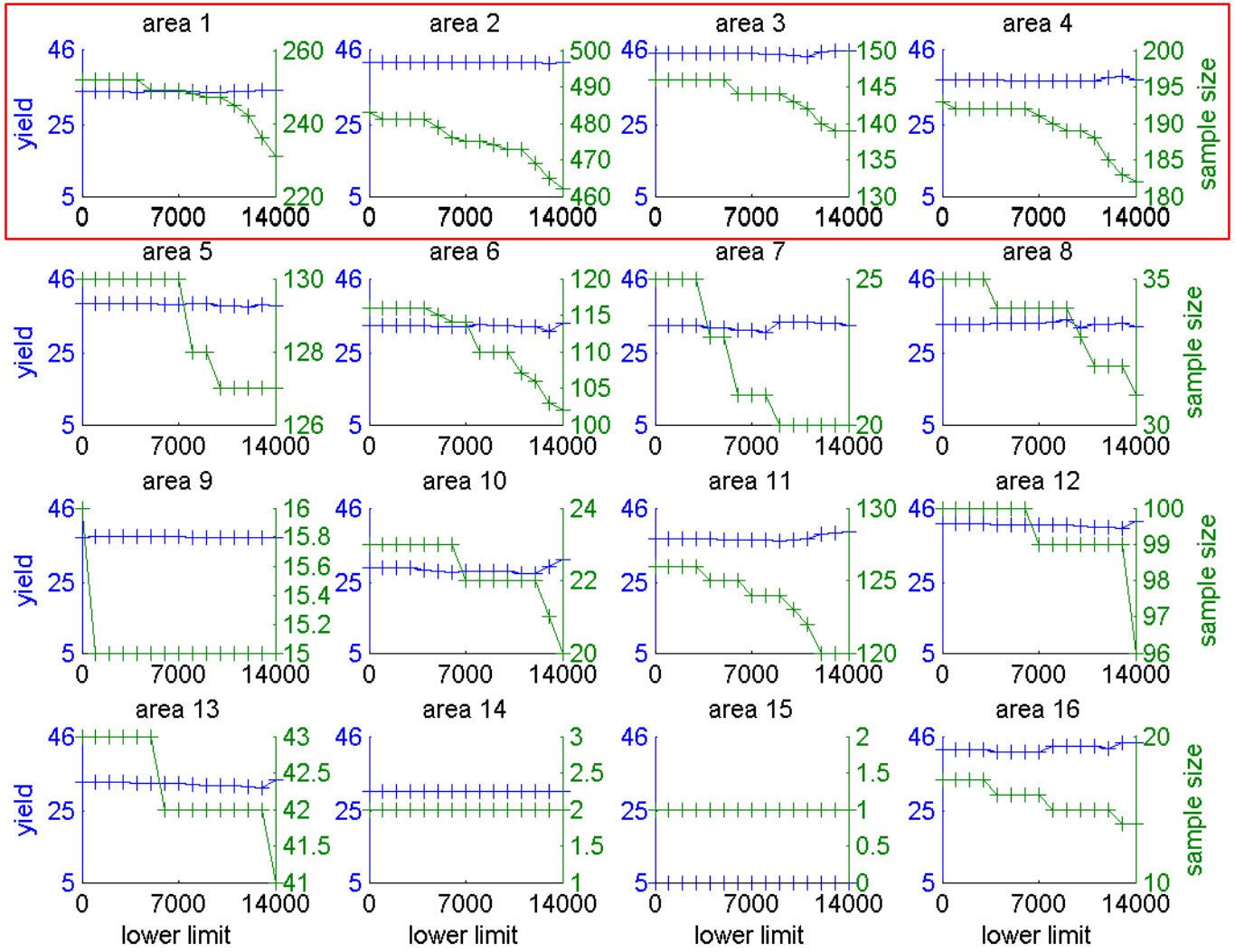
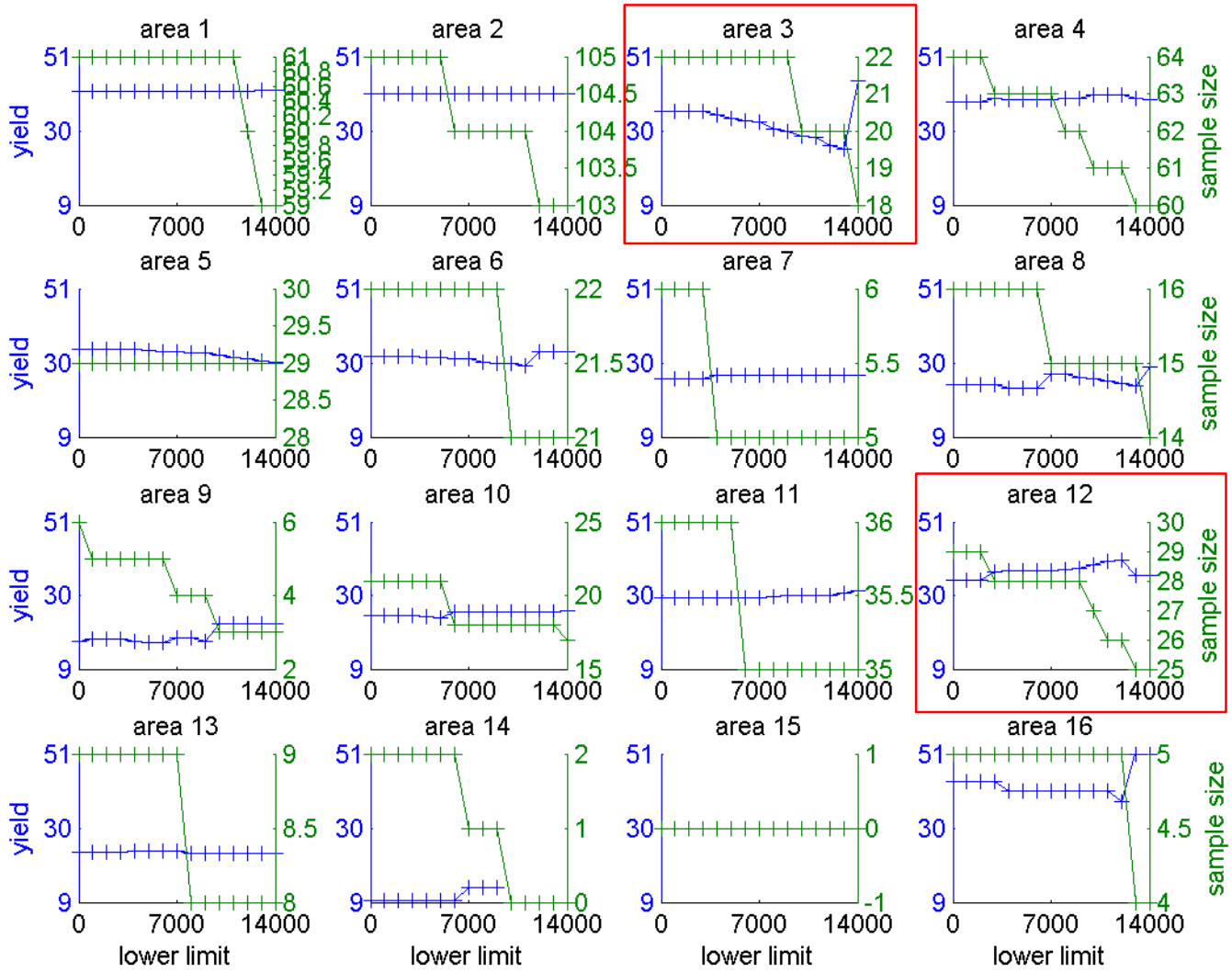
Results: spring wheat



Results: rye



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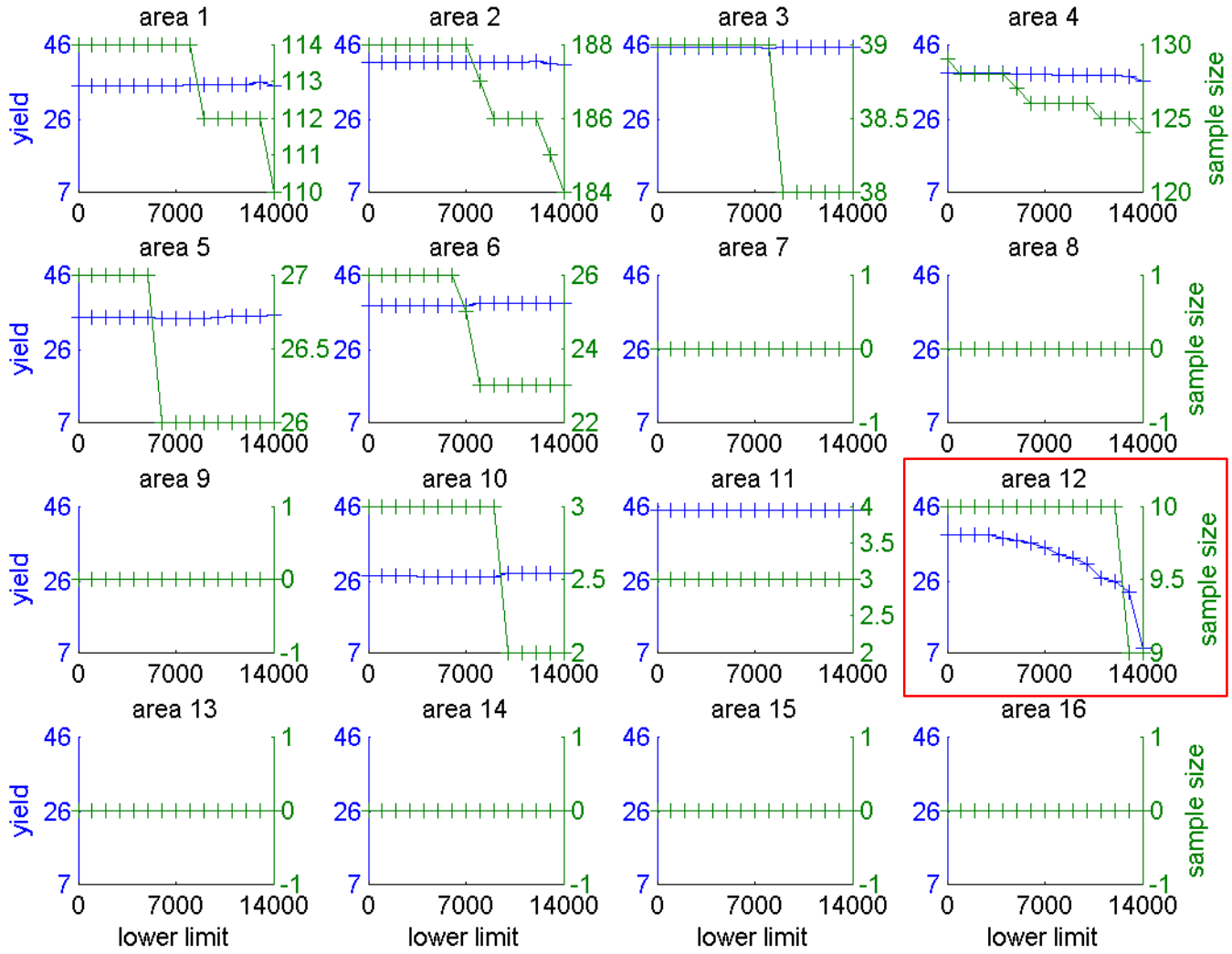
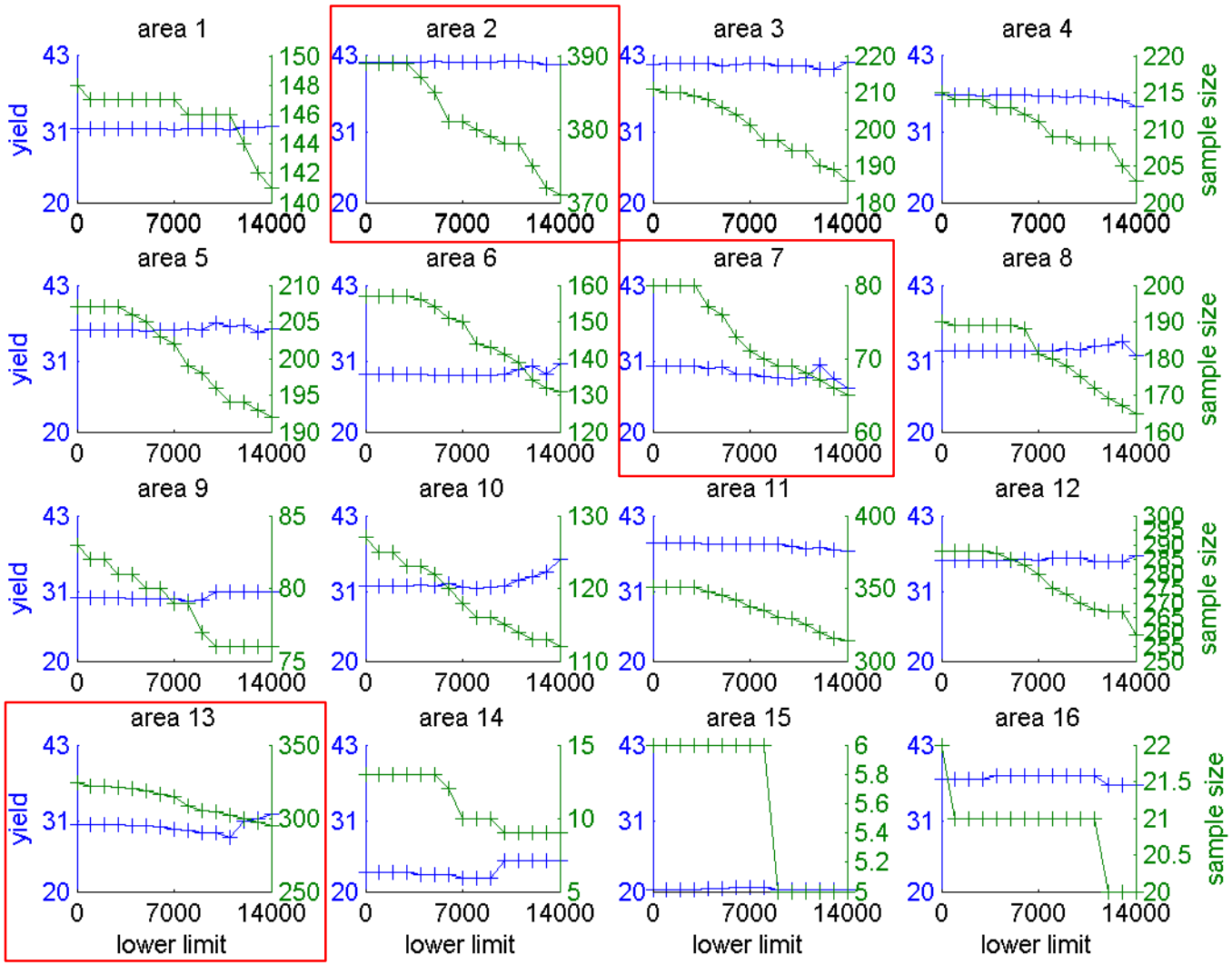
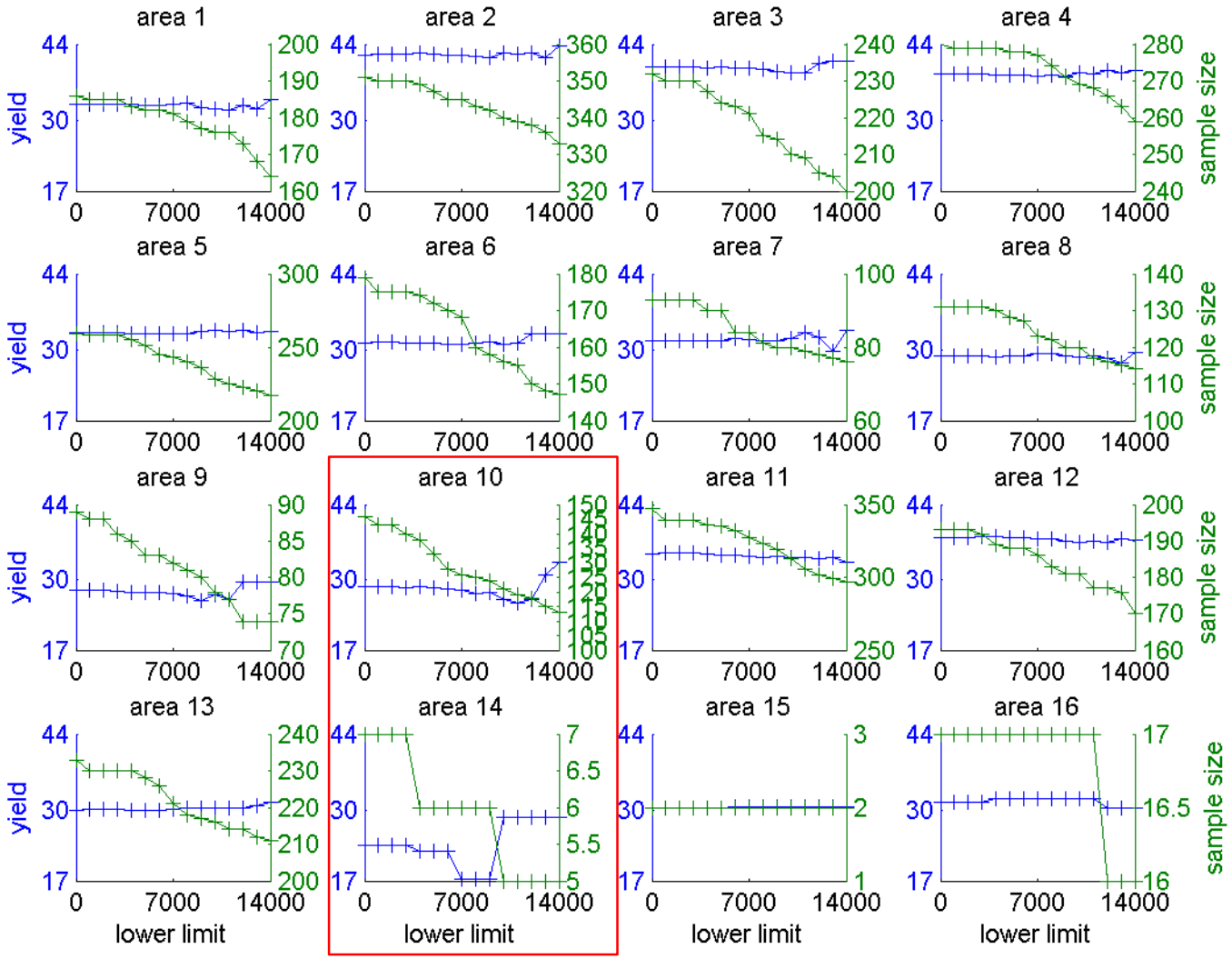
Results: malting barley



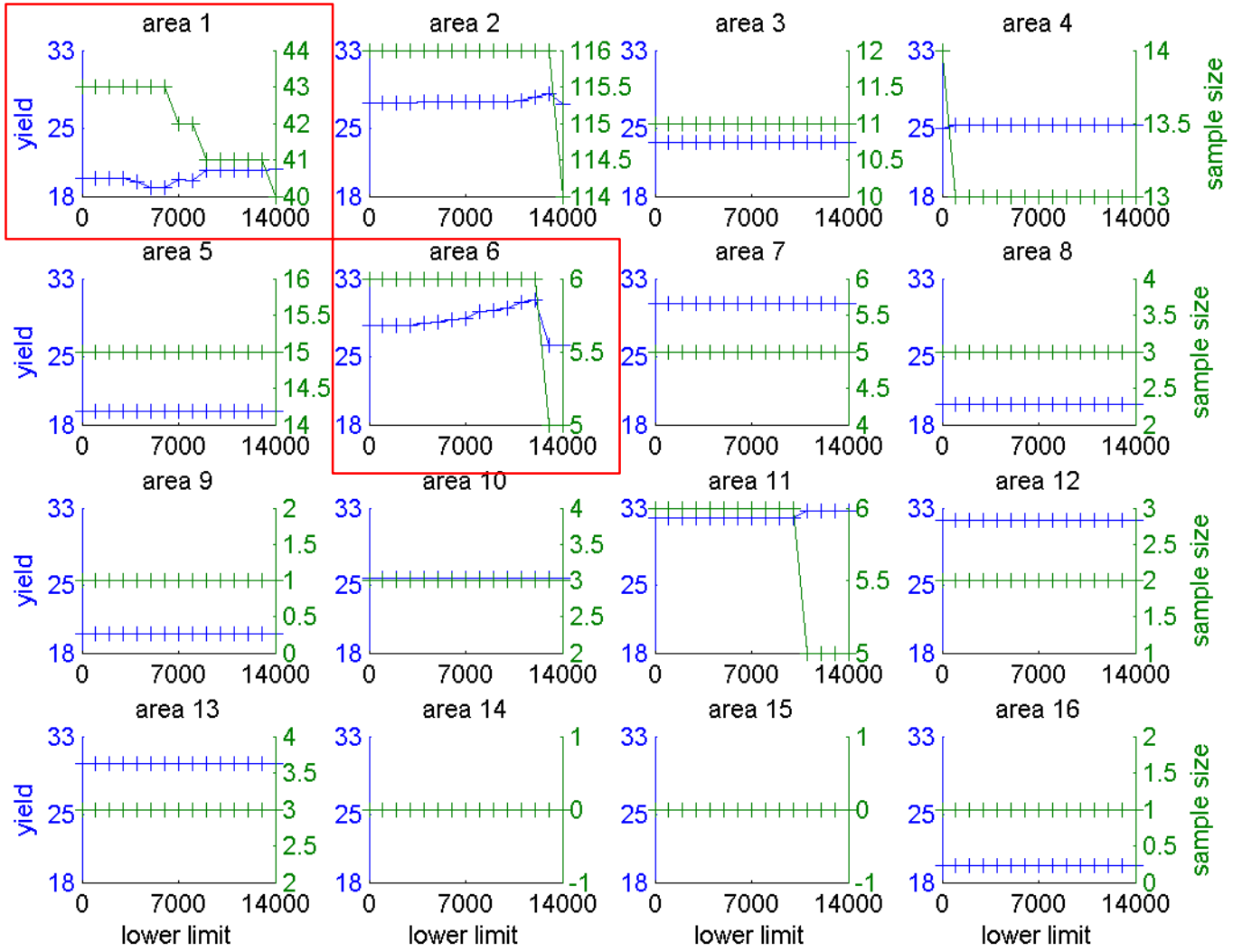
Results: other barley



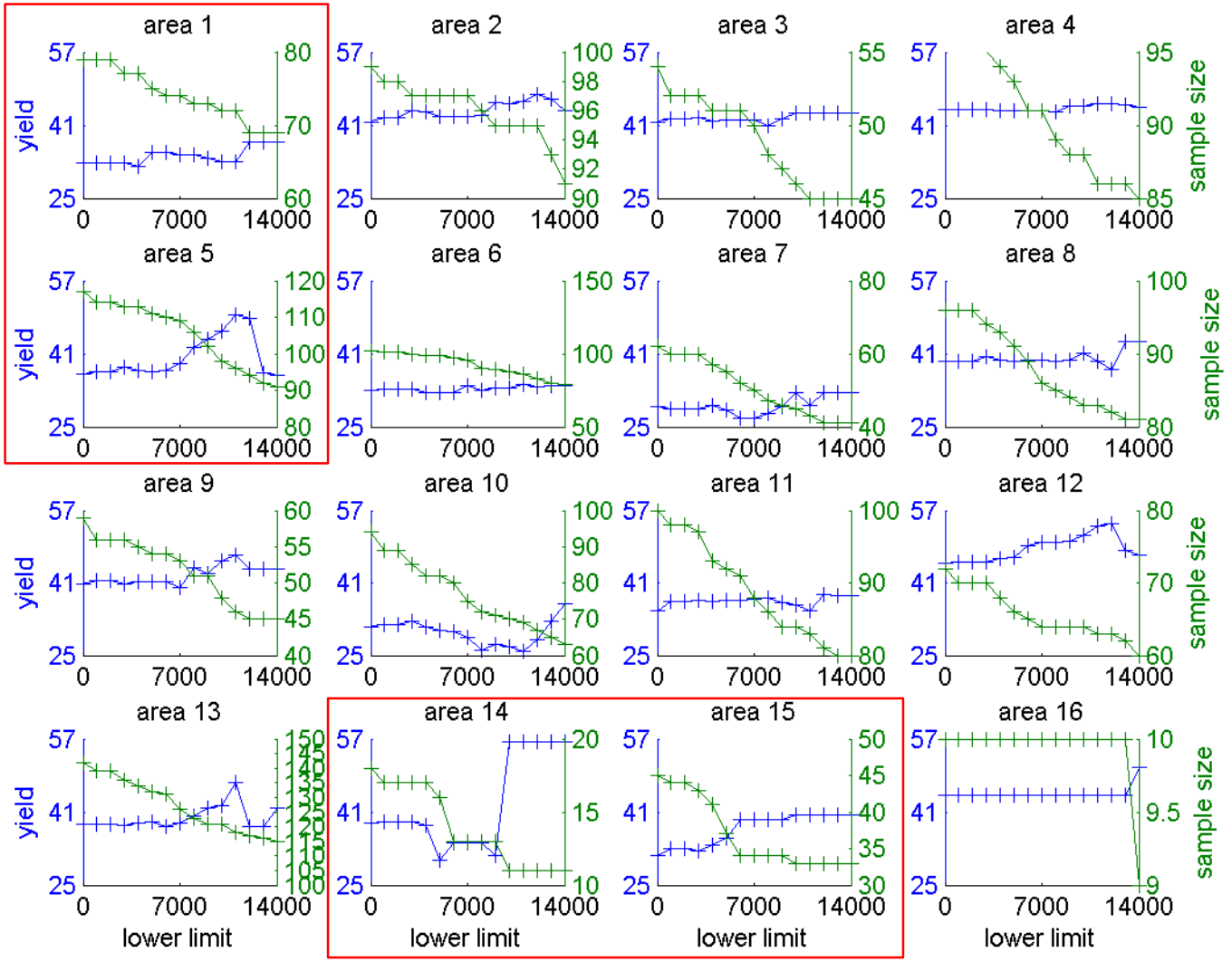
Results: oats



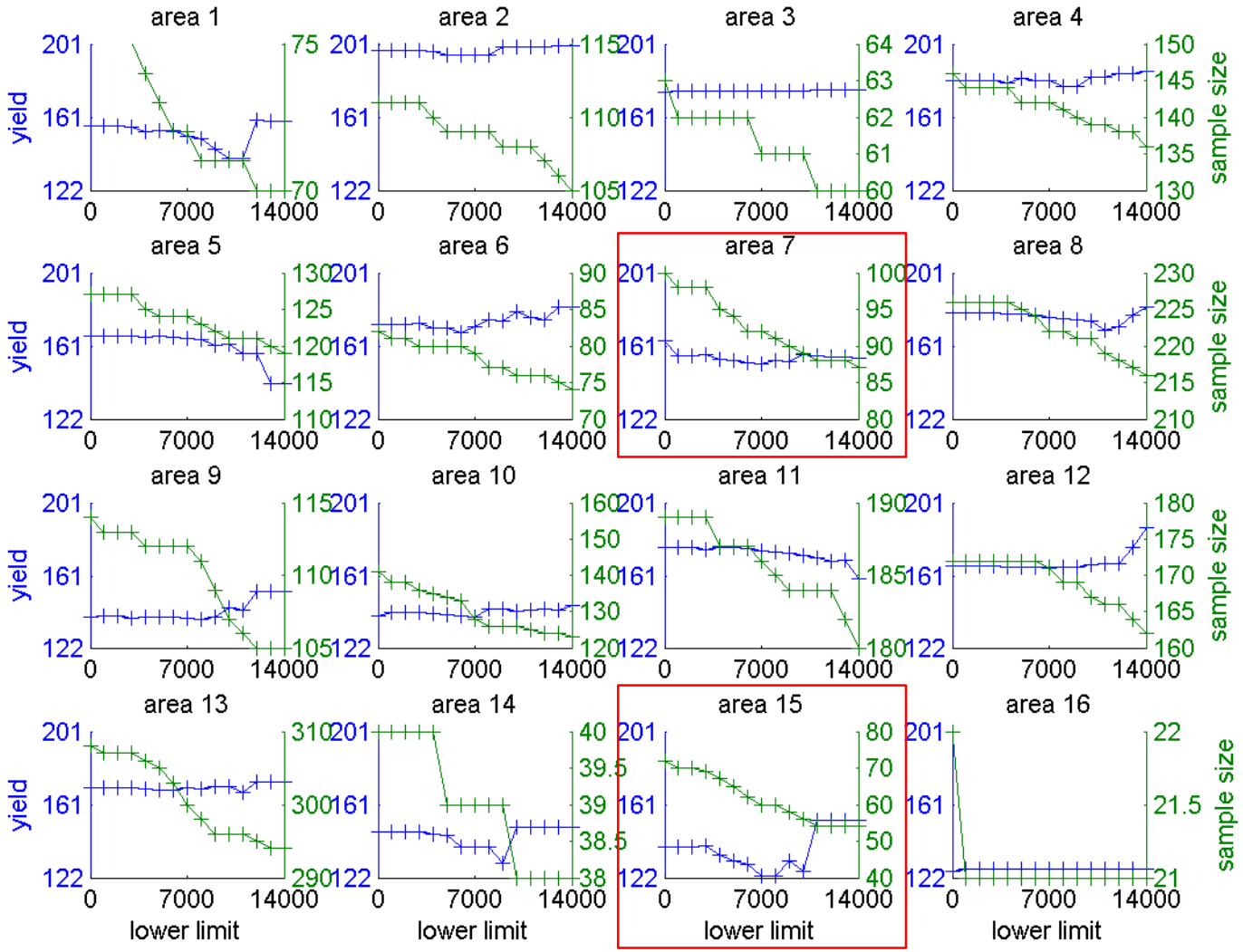
Results: peas



Results: hay



Results: silage



Results

- Similar figures for 31 other crops
- The estimates wander due to changing sample weights
  - Farms in many strata used to estimate each crop yield
- Large jumps if just few farms in an area produce a crop
- Effect of dropping smallest farms differs between crops and areas
- Typically, farms below 5000 € have little effect
  - Exceptions: hay and silage in some areas

Summary

- Crop estimates were calculated by stepwise dropping the smallest farms from the sample
- Stratification and weighting was adjusted during simulated sample size reduction
- First analysis, first results
- The smallest farms seem to have little effect on crop estimates
- Usually, somewhere above 5000 € the effect starts to increase
- Maybe leave farms with size <5000 € out of the sample
- Significance of very small farms in FADN?

Thank you!

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