A Matter of Scale

How productive are small farms (20ha and less)?

Introduction

- Landworkers' Alliance (LWA)
- Over 400 members
- Food sovereignty
- Campaigns & solidarity
- Policy bias against small farms
- Planning appeals
- Data gap
- Work with Centre for Agro-ecology, Water and Resilience at Coventry University

Why study productivity of small farms?

- “Productivism phobia” among environmentalists
- Eco-farms have many functions
- Food production and financial productivity are key
- Measuring productivity against scarce parameters
  e.g. land, energy, labour and capital
- Inverse relationship in tropical areas
- Future farms must be productive AND sustainable

Methodology

- Quantitative and qualitative survey
- Aim for large sample (at least 100)
- Holdings 20ha and less
- Recruited sample at:
  - 6 regional LWA meetings
  - Other conferences (eg Organic Producers' Conference, Organic Growers' Alliance)
  - Magazines and newsletters

OESSHOOTS
PERMACULTURE
SITE

Survey – Areas of questioning

Productivity of crops and livestock

- Physical productivity – kg/tonnes per m^2/ha
- Enterprise and crop diversity
- Income per ha

Variables

- Land quality/soil type
- Labour and other inputs
- Level of experience

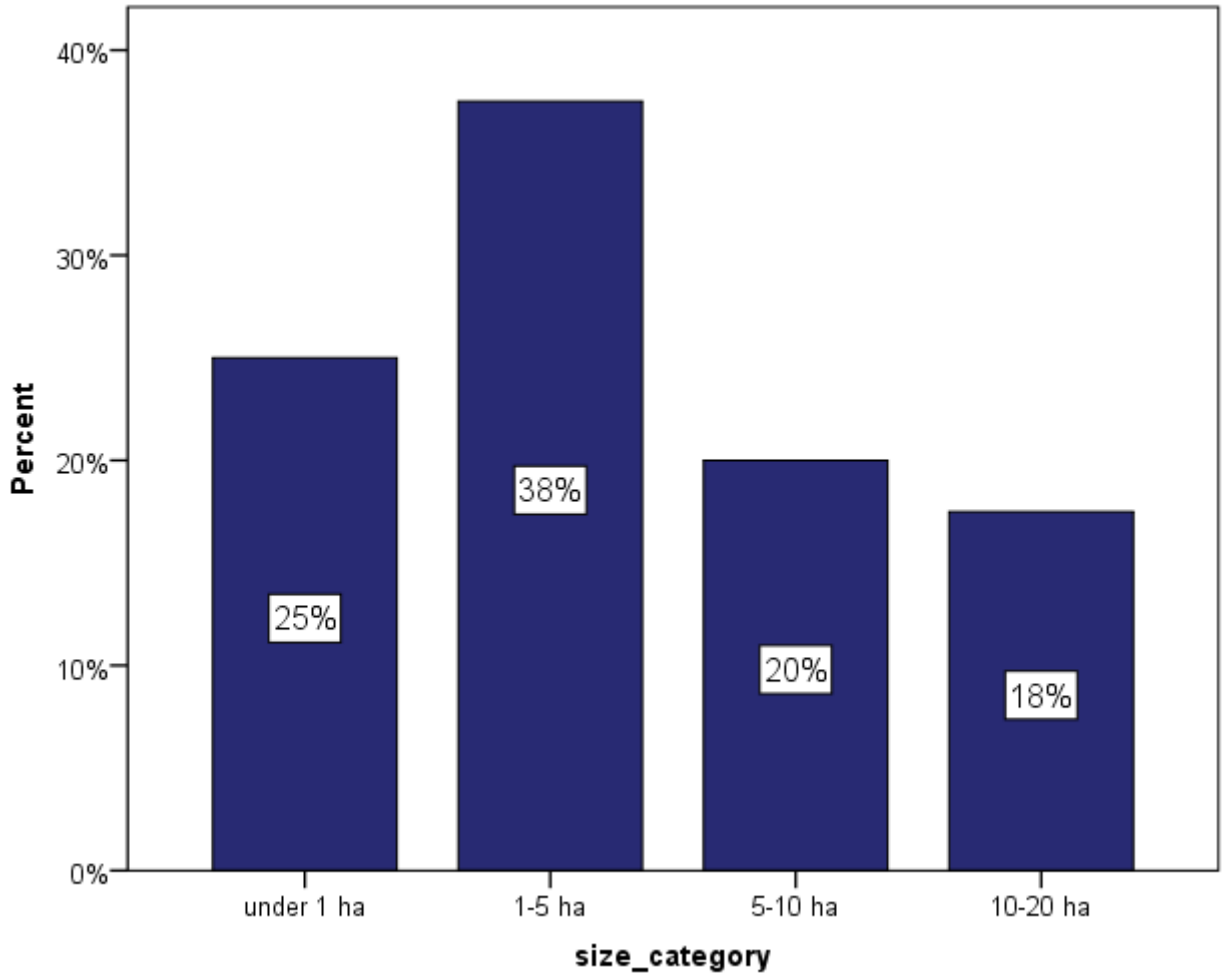
Qualitative Questions

- Environmental and social benefits
- Barriers to productivity

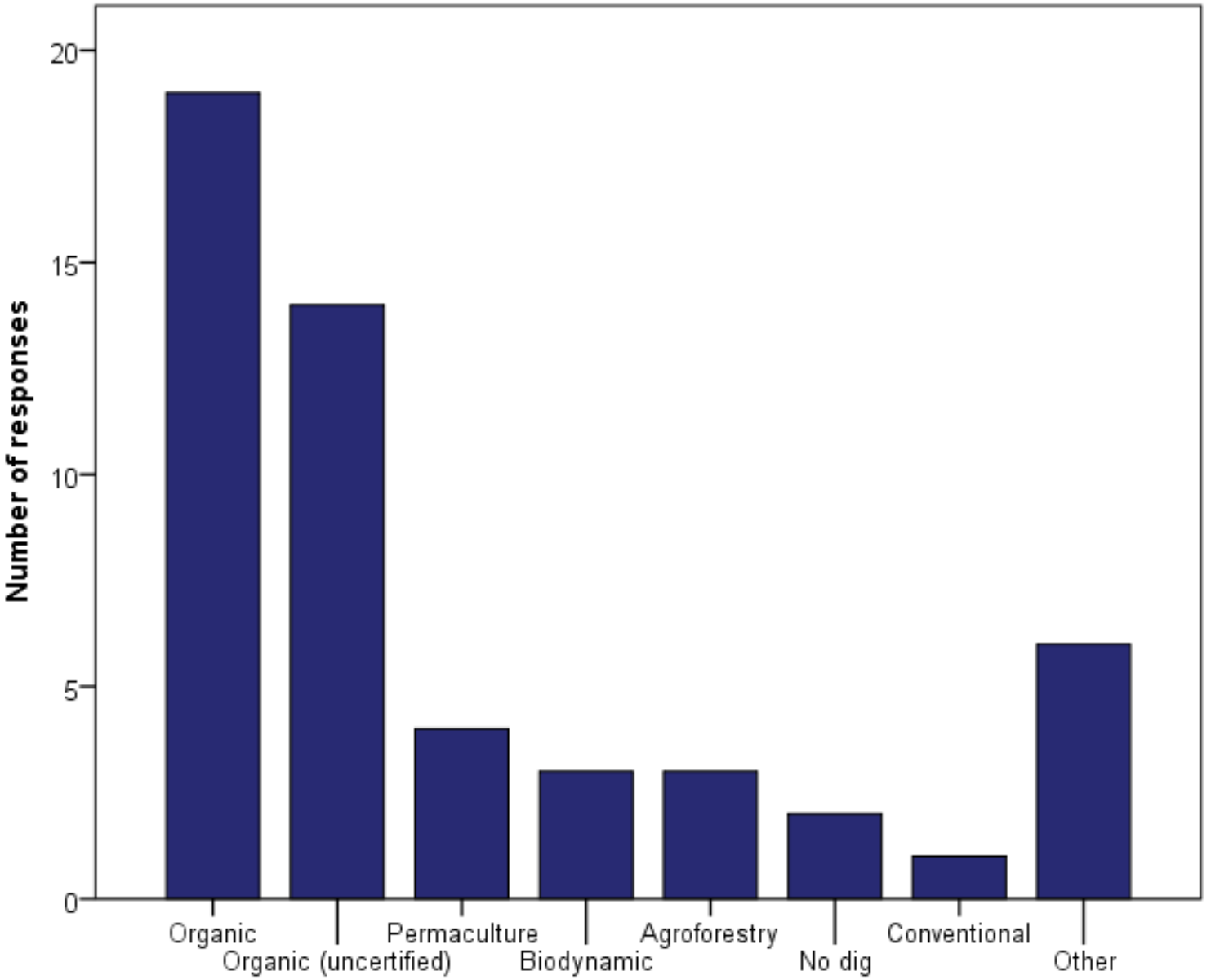
Results – Quantitative

- Size of Holding
- Eco-management system
- Diversity
- Productivity
- Income per ha

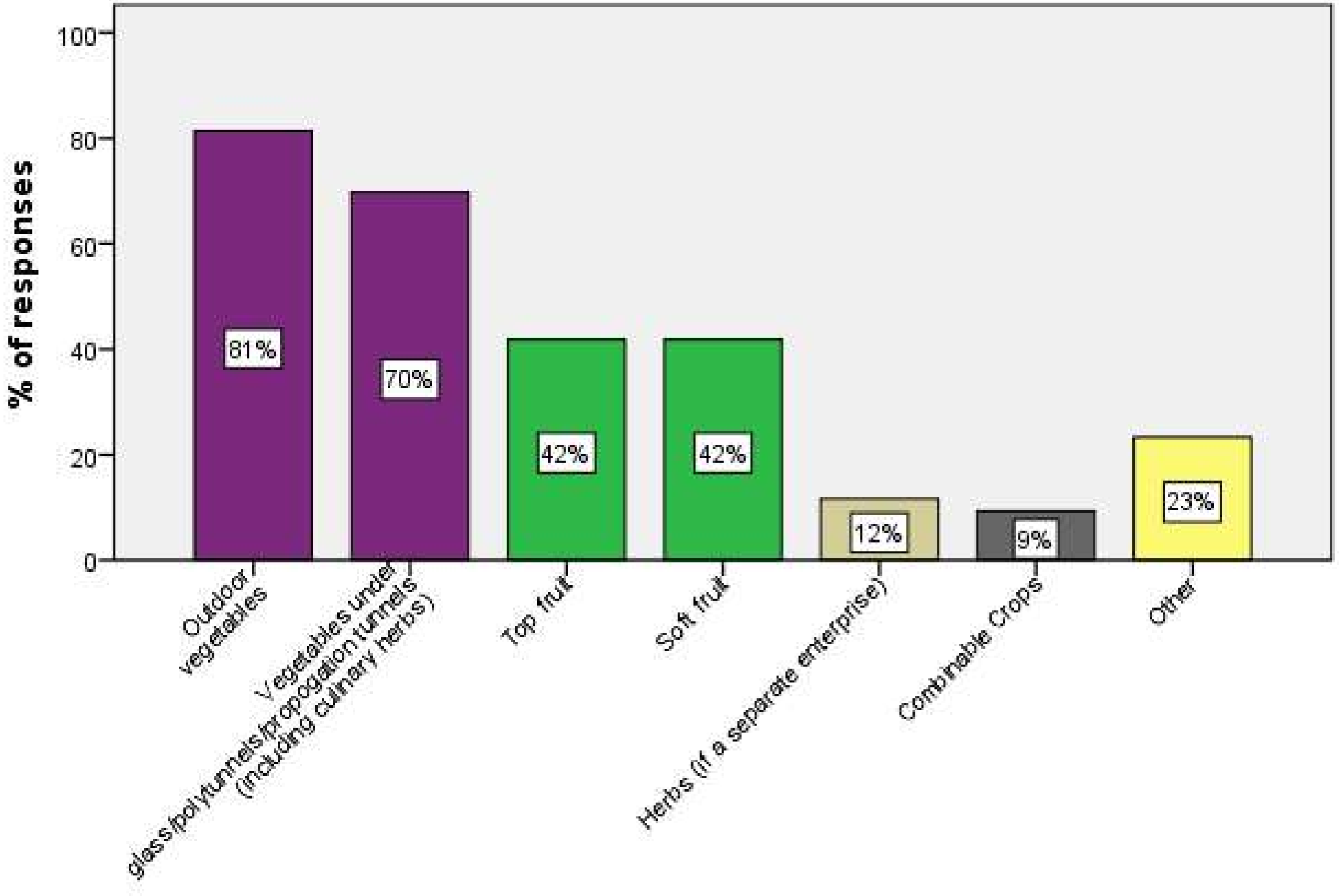
Size of Holdings



Eco-management system



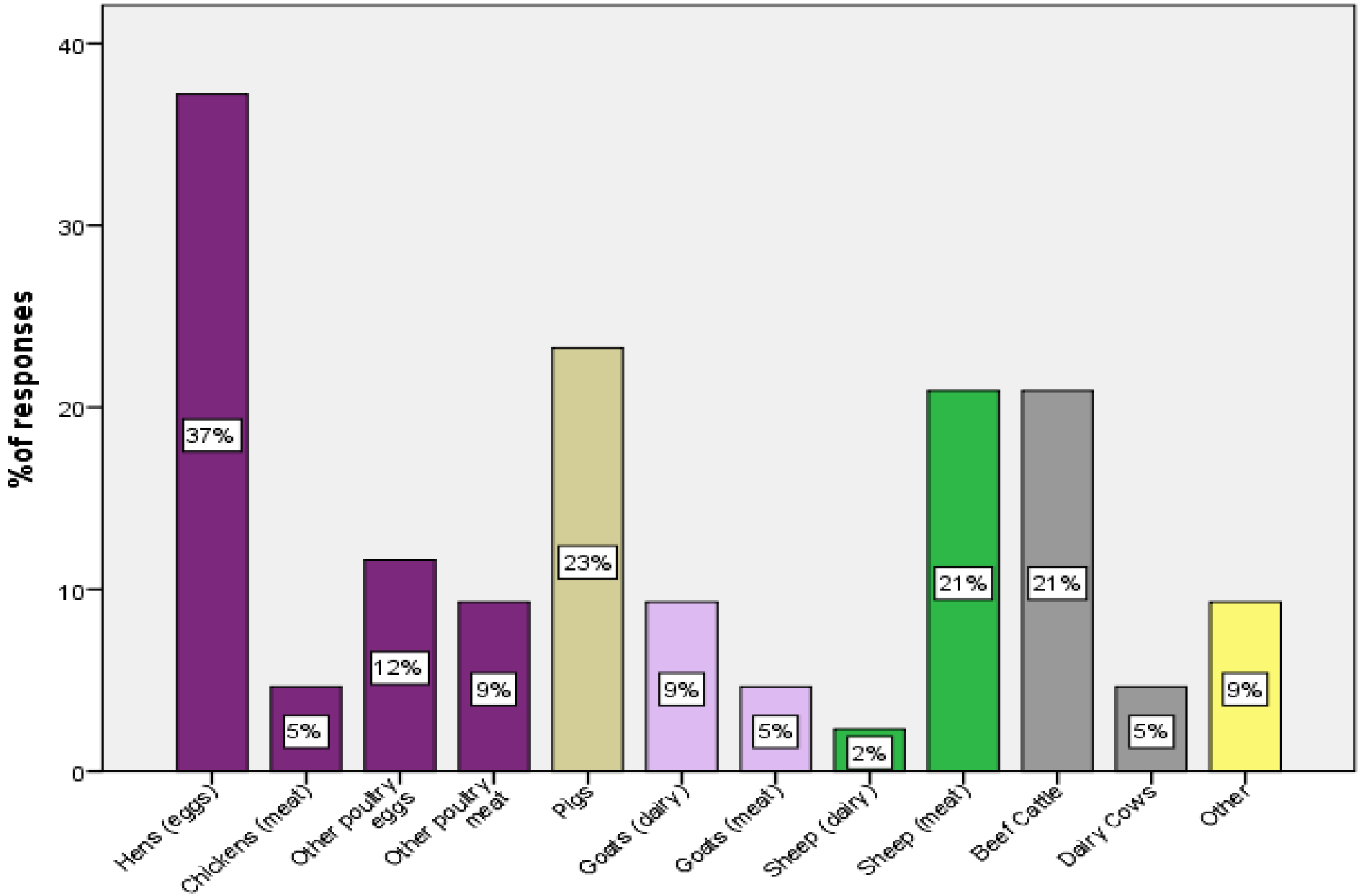
Crop enterprises



Other Enterprises

- edible flowers 1
- cut flowers 4
- firewood/coppice 2
- horse livery 1
- education and training 2
- honey 3
- allotments 1
- dandelion tea and coffee 1
- hops 1
- woodland 1
- value added products (jam/juice/cheese/wedding catering) 1

Livestock Enterprises



Vegetable Productivity in Numbers

- 36 vegetable growers
- Average no. types of vegetable grown 28 (Range 1-70)
- 2kg/sq m Mean yield across 10 indicator types
- Maximum yields Total veg area of top holding m^2 (acres)
  - Leaf beet and chard (10kg/m^2) 7500 (1.88)
  - Squash (5.56kg/m^2) 2000 (0.5)
  - Tomatoes (12.5kg/m^2) 8500 (2.13)
  - French beans (8.42kg/m^2) 7500 (1.88)
  - Salad (6kg/m^2) 10000 (2.5)

Comparison with Standard Organic Productivity (Yields of Vegetables kg/sq m)

Vegetable	Standard Organic Yield	Smallholder Mean	Rank 1 Smallholder	Rank 2 Smallholder	Rank 3 Smallholder
Potato	2.3	1.27	3.2	3	2.37
Carrot	2.5	2.16	5	3.33	2.53
Leek	1.2	1.68	10	4.17	3.33

Fruit by the Bushel

Soft Fruit (14 growers)

•17 varieties

•Plots range from 90-1000sq m

•Yield range 0.08-3kg/sq m (average 0.81kg/sq m)

Large farm – Mean yield organic strawberries 0.73kg/sq m

Top fruit (16 growers)

• Orchards size 6 sq m to 9 ha (mean 3.4ha)

•Yields range from 0.01-2.5kg/sq m (mean 0.55kg/sq m)

Birds and Beasts

Livestock	No. holdings with enterprise	Production area range	Herd/Flock size range	Mean Yield Eggs, milk or animals sold /yr	Top yield (eggs/bird or kg meat/ha)
Laying Hens	17	-	5-150	185	300 eggs
Laying Ducks	7	-	3-20	57	117 eggs
Cattle	10	1.4-43ha	1-45	4.62	440kg/ha
Sheep	14	1-14ha	5-65	29	250kg/ha
Pigs	10	0.08-2.5ha	2-30	15	2800kg
Goats (for meat)	2	0.5-1	2		-
Poultry meat	6	0.5-1	10-100	13.5	-
Dairy cows	2	-	2	5475 litres	3832 litres
Dairy goats	4	0.5	4-5	1085 litres	1440 litres

Comparative Yields (tonnes/ha)
Small and Larger Organic Farms

	Small Agro-ecological 20ha and less	Average Organic Farms (from Organic Farm Management Handbook)
Vegetables	20	18
Soft Fruit	8.14	7.3
Top Fruit	3.93	11.9
Eggs	185 eggs/hen	280 eggs/hen
Dairy	3832 litres/ha	8000 litres/ha

Holding 1 - Horticulture and Hens

10 hectare holding (3ha for food production)

- 1 ha vegetables (2nd highest average yield)
- 100 sq m soft fruit (3kg/m)
- 150 laying hens (267 eggs/hen/yr) + 20 ducks
- Cut flowers

Gross annual income £34,500

Net annual income £7,000

Second year of production!

Holding 2 - Meat and Eggs

A12 ha (30acre) holding

- Beef (8 x 220kg meat/yr)
- Lamb (23 x 24kg meat/yr)
- Pork (23 x 91kg/yr)
- Chickens, Turkeys and Geese
- 50 Hens (150 eggs/hen)
- 20 Ducks (100eggs/duck)

Gross annual income £92k

Net income £26k

Holding 3 - Highly Diverse

- 10 ha – 11 enterprises
- Vegetables
- Soft and top fruit
- Sheep, cattle, pigs and goats
- 50 laying hens
- 2 milk cows (7300litres/yr)
- Cheese, bacon, jams and other processed products
- Catering for weddings

Annual gross income £52k

Net income £13.4k

Results - Qualitative

- Polycropping methods
- Reasons for change in productivity
- Barriers to productivity
- Environmental benefits

Polycultures

- Succession sowing/planting
- Companion planting
- Mixed farm rotation
- Animals clear after cropping (eg pigs)
- Agroforestry
  - Woodland and animals (cattle/goats)
  - Orchards with poultry/sheep
  - Alley cropping between apple trees

Barriers to Productivity

- Insufficient labour (13)
- Lack of time (10) and energy (3)
- Low wages/income from selling food (9)
- Limitations of land (6)
- Lack of space (5)
- Capital investment
  - Insufficient start up capital (10)
  - Inadequate equipment/infrastructure (5)

Environmental and Social Benefits

- Biodiversity
- Fewer inputs, less waste, closed loop
- Soil care
- Carbon sequestration/reduced emissions
- Less pollution
- Local marketing = Less food miles
- Better food
- Community building

Conclusions So Far

- Measuring productivity is very complicated!!!
- Diverse range of crops - hard to compare
- No clear correlations yet
- High productivity (per unit area) IS possible!
- Barriers to productivity
    - Labour, time and energy
    - Capital investment
- Multiple environmental and social benefits

Challenges

- Piloting questionnaire
- Delay in launching survey until Spring
- People too busy to respond
- Survey too complicated
- Analysing data (so much of it to make sense of!)

Next steps

- Film/interview most productive holdings "Why are they so productive?"
- Autumn Survey (October) with simpler questionnaire PLEASE TAKE PART
- Skill share event for respondents

Take home message

- Productivity data is important
- Policy makers rely on evidence
- **WE** need to demonstrate that agro-ecology can feed the world