Increased output in UK agriculture 1935-85:

using Farm Management Survey data from south-west England to explore processes of technical change

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Volume of UK agricultural output

Growth rate peaked 1945-65
Sources of output growth

- Change the output mix
- Change inputs
  - Because output prices change
  - Because input prices change
- Increase output per unit of input
  - By increasing output
  - By decreasing inputs
What do we already know?

- A lot about what happened at the *national* level
  - More output with less labour and more capital
  - Arable expanded more than grazing livestock
# Agricultural output in England and Wales

<table>
<thead>
<tr>
<th></th>
<th>1940</th>
<th>1960</th>
<th>1979</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereals (m.tons)</td>
<td>5.5</td>
<td>7.9</td>
<td>16.9</td>
</tr>
<tr>
<td>S. beet (m.tons)</td>
<td>2.7</td>
<td>7.3</td>
<td>7.7</td>
</tr>
<tr>
<td>Cattle (millions)</td>
<td>7.0</td>
<td>8.8</td>
<td>9.7</td>
</tr>
<tr>
<td>Sheep (millions)</td>
<td>17.7</td>
<td>18.4</td>
<td>21.6</td>
</tr>
<tr>
<td>Pigs (millions)</td>
<td>3.4</td>
<td>4.3</td>
<td>6.6</td>
</tr>
<tr>
<td>Poultry (millions)</td>
<td>51.8</td>
<td>82.7</td>
<td>108.6</td>
</tr>
<tr>
<td>Milk (billion litres)</td>
<td>8.1</td>
<td>11.9</td>
<td>15.4</td>
</tr>
</tbody>
</table>
What do we already know (2)

- Less about the differences between
  - Expanders
  - Survivors
  - Failures

- Not much about *why* it happened
  - Interwar/postwar price response differences
  - Impact of external influences
We need a farm-level dataset

- The UK Farm Management Survey was established in 1937
And is still going
The FMS contains information on:

- Outputs
- Inputs
- Labour
- Capital
Preliminary analysis of the Farm Management Survey

- 10,000 field books
- Farms remained in the survey for 15 years – in theory
- But some farms stayed in for 40 years
- Full or partial data extraction
Analysing the accounts for changes

- Outputs
- Yields
- Inputs / costs

- Performance measures
  - Purchased inputs / £100 labour cost
  - Output per £100 labour cost
  - Output per £100 input
Output per acre indices for dairy farms \((1940 = 100)\)

<table>
<thead>
<tr>
<th>Farm code number</th>
<th>1960</th>
<th>1979</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>216</td>
<td>304</td>
</tr>
<tr>
<td>115</td>
<td>135</td>
<td>177</td>
</tr>
<tr>
<td>192</td>
<td>186</td>
<td>378</td>
</tr>
<tr>
<td>209</td>
<td>162</td>
<td>87</td>
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<tr>
<td>466</td>
<td>173</td>
<td>184</td>
</tr>
<tr>
<td>515</td>
<td>228</td>
<td>472</td>
</tr>
<tr>
<td>524</td>
<td>230</td>
<td>442</td>
</tr>
</tbody>
</table>
Output per acre indices for livestock farms \((1940 = 100)\)

<table>
<thead>
<tr>
<th>Farm code number</th>
<th>1960</th>
<th>1979</th>
</tr>
</thead>
<tbody>
<tr>
<td>106 lowland</td>
<td>224</td>
<td>400</td>
</tr>
<tr>
<td>469 lowland</td>
<td>136</td>
<td>115</td>
</tr>
<tr>
<td>497 lowland</td>
<td>156</td>
<td>214</td>
</tr>
<tr>
<td>162 upland</td>
<td>349</td>
<td>422</td>
</tr>
<tr>
<td>324 upland</td>
<td>307</td>
<td>420</td>
</tr>
</tbody>
</table>
### Some unexpected cost ratios

<table>
<thead>
<tr>
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<th>1940</th>
<th>1960</th>
<th>1979</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchased inputs / £100 labour</td>
<td>329</td>
<td>310</td>
<td>309</td>
</tr>
<tr>
<td>Output / £100 labour</td>
<td>384</td>
<td>421</td>
<td>388</td>
</tr>
<tr>
<td>Output / £100 input</td>
<td>115</td>
<td>135</td>
<td>130</td>
</tr>
</tbody>
</table>
But specialisation increases as expected

- Average index of farm specialisation for 12 farms
  - 1940 = 50.6
  - 1979 = 74.6

Changes for 5 mainly dairy farms →
Consistent results for mechanisation

- 9 out of 12 farms had horses in 1950
- None had horses in 1955
- 10 of the 12 farms bought tractors during the war
Conclusions (1)

- Should we use the whole archive to produce comparative data?
- Or produce individual farm histories year by year supported by oral history
Conclusions (2)

- We are interested in the *processes* of technical change
  - Is south-west England typical? We can use Reading data for comparison with other regions
  - We are also analysing official promotion of technology, extension and education, and the impact of the media
Conclusions (3)

- Still working on the big question – was output increase the result of
  - More inputs, or
  - More outputs per unit of input