2011 ORGANIC PRODUCERS' CONFERENCE

The Trouble with Oats?

Cark Maunsell

Oat Services Ltd

Oat Services Ltd

- Who are we?
- Growing organic oats
- The Markets
- The Role of Research
- Lost opportunity or irrelevant to the organic farmer?

Who Are we

- Organic importers of mainly wheat from Argentina and Canada…… and oats!
- ***…. Used to be!***

Who Are we

- Manufacturers and Distributors of Ecocert NATURAL Ingredients for use in cosmetics

Oat cosmetics
The natural ingredient house

Colloidal Oat Flour

Oat oil

Oat Peptides

Oat Exfolients

Oat Beta-glucan

Oat Avenanthramides

Lupin Peptides

Oat Butters

Who Are we

- Manufacturers of bespoke oat blends for the bread industry

Who Are we

Research and Development

Chairman of the Project Management Committee: QUOATS

"There is nothing like an Oat"

That's not the title of a new version of the musical "South Pacific" but it could be the anthem of an ambitious new R&D project called "Quoats". "Little disease, few weeds and impressive yields", ORC crop researchers, **Helen Pearce** and **Thomas Döring** report on first year trials in pursuit of sustainable oat production.

It's well known that oats are generally a good fit in organic rotations and the "Quoats" project – Harnessing new technologies for sustainable oat production and utilisation – aims to make them even better. This five year (2009 – 2014) research project, led by IBERS, Aberystwyth University, brings together a wide range of organisations in the supply chain, from breeders to end-users, to improve the quality and performance of oats.

As part of the project, ORC is carrying out field trials to assess the suitability of new oat lines for organic management systems, with particular emphasis on nutrient use efficiency. Eight varieties are being trialled at Wakelyns Agroforestry, Suffolk, including some naked oats, i.e. hull-less oats. These are particularly valuable for feed due to their high oil content and a beneficial amino acid profile. Similar trials are being run under non-organic management systems by ADAS in Nottinghamshire.

The trial is subject to two fertility treatments: untreated and treated with organic chicken manure pellets. The purpose of this added fertility is to investigate how efficient the new varieties are at taking up nutrients from the soil, but it will also help in testing lodging resistance; adding fertility tends to increase lodging, thus helping to distinguish between varieties with high resistance.

This year, the Wakelyns trial has looked good throughout the season, but suffered slightly from the drought, as evidenced by shorter straw than usual. There was very little disease or weed pressure, and yields were impressive. The highest yielding hulled variety was Mascani at 9.7t/ha. Of the naked varieties, a new line being bred by IBERS gave the highest yield at 6.2t/ha. Wet weather at harvest resulted in some varieties lodging, in particular Mascani. The oats will be analysed for their protein and oil content, as well as their physical quality, and the results from these analyses will be available soon.

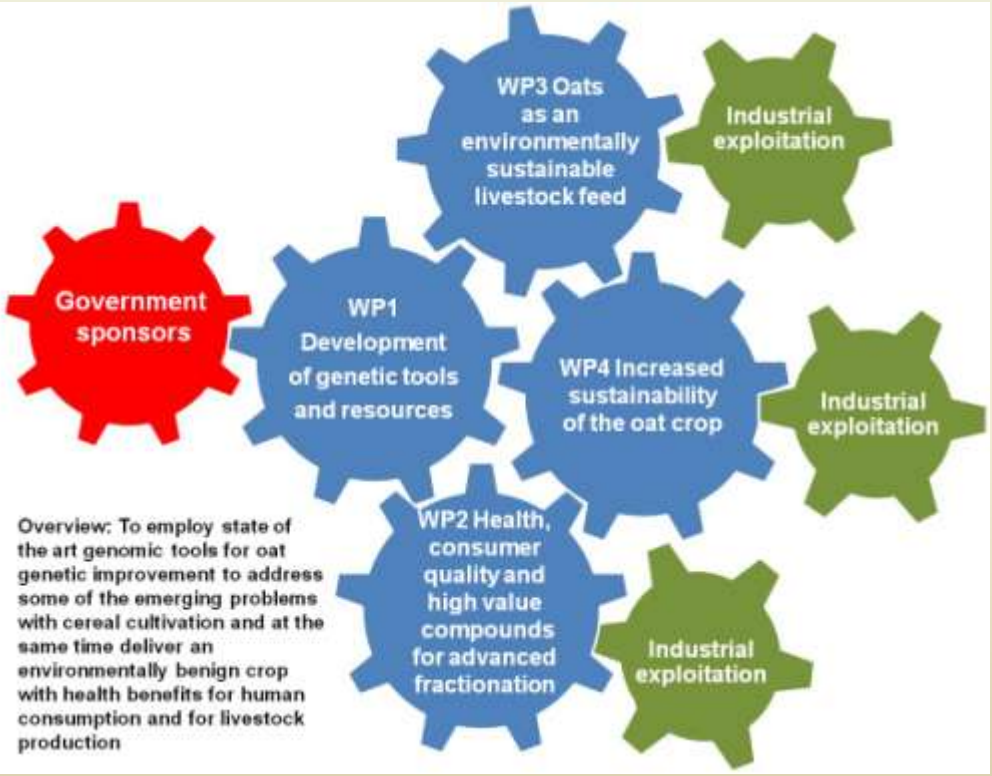
The pivotal part of Quoats is a breeding programme. Using a combination of conventional phenotypic selection and modern molecular marker technology, the breeders at IBERS hope to develop varieties that maximise the value of oats as a nutritious cereal for humans and livestock. With human consumption in mind, the emphasis will be on improving the beta-glucan content, a compound that can help reduce cholesterol levels. Further work will be directed at physical grain quality, such as kernel content.

Improving the quality of oats as a livestock feed is also a goal. Initial results from in vitro studies suggest that oats might reduce methane emissions from the rumen and results are now being validated in vivo. One focus of the project is to determine the effect of different oat lines on methane emissions.

We already know that oats are an environmentally benign crop, requiring fewer inputs than other cereals such as wheat, and can produce a good crop even on soils of relatively low nitrogen status. Quoats will help to make oats an increasingly attractive part of organic rotations and conventional rotations, thereby making the environmental and health benefits of this crop more widely available.

The Quoats project is funded by AHDB and industry partners and is jointly sponsored by BBSRC, by Defra through the Sustainable Arable LINK Programme, by European Regional Development Funding through the Welsh Assembly Government's Academic Expertise for Business (A4B) Programme and through the Scottish Government Cereals Research fund. Refer to the project website **www.quoats.org** for further details.

Oat trials ready to harvest

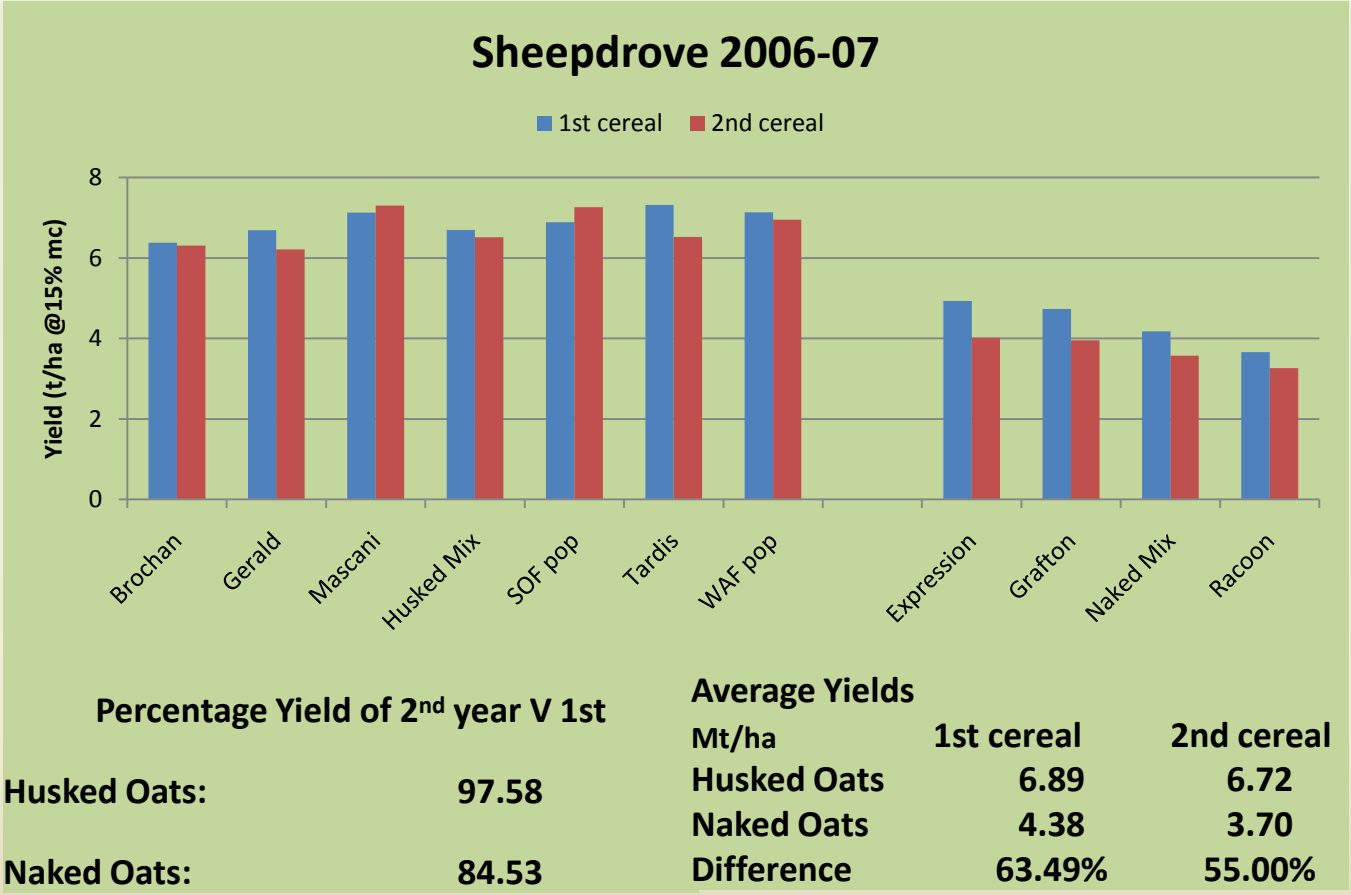


Issues Facing Organic Oats

- Production
  - Not crop competitive?
  - Environmentally unfriendly
  - Difficult to grow organically
- Consumption
  - Human Food
  - Animal Feed
  - Industrial

Production

Oats Perform well in Second Cereal Rotation



Percentage Yield of 2nd year V 1st	
Husked Oats:	97.58
Naked Oats:	84.53

Average Yields Mt/ha	1st cereal	2nd cereal
Husked Oats	6.89	6.72
Naked Oats	4.38	3.70
Difference	63.49%	55.00%

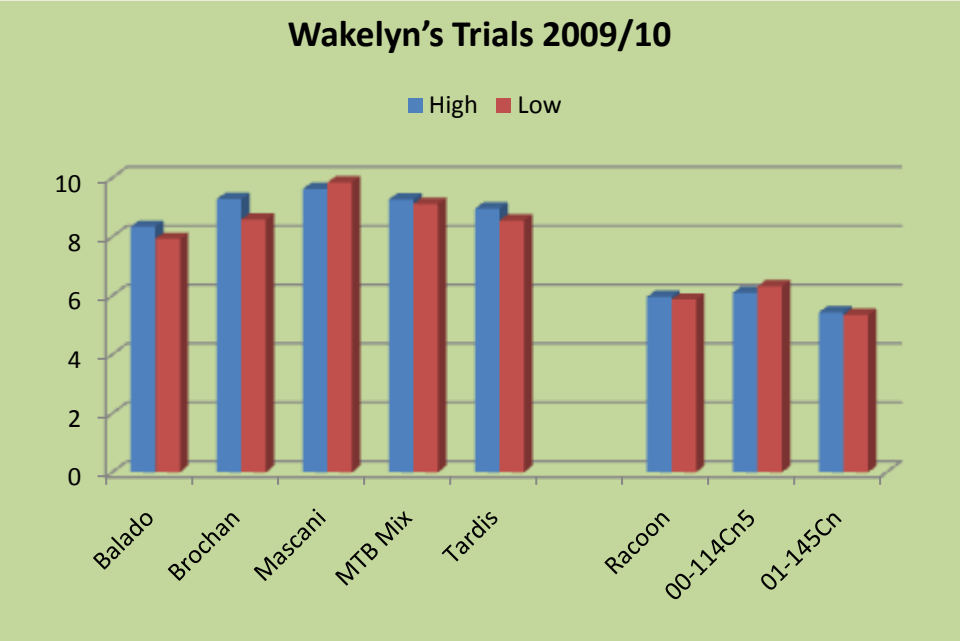
"We had 2 wheat trials at Sheepdrove in 06/07 and the mean yields of these trial were 4.8t/ha and 4.9t/ha, but it will have been in a different field, so as with comparing 1st and 2nd oats, a direct comparison is difficult!"

Source: Helen Pearce - Organic Research Centre

Results from only one year's trials should be treated with caution!

Production

Oats Perform well in High and Low Fertility



High V Low Fertility Yield	
Husked Average	95%
Naked Average	100%

Average Yields		
Mt/ha	High	Low
Husked Oats	9.09	8.81
Naked Oats	5.83	5.84
Difference	64.13%	55.00%

"These were both grown as a 1st cereal, after a particularly good white clover ley. We added fertility (organic chicken manure) to half of the plots but this didn't make a significant difference to the yield – the fertility in the soil from the ley was probably already fairly high"

"Our main wheat trial at Wakelyns had a mean wheat yield of 9.0t/ha – our highest ever wheat yield at Wakelyns, and although they were actually in the same field as the oats, the oats didn't have their best ever year – it seems as though the drought affected the oats more than it did the wheat."

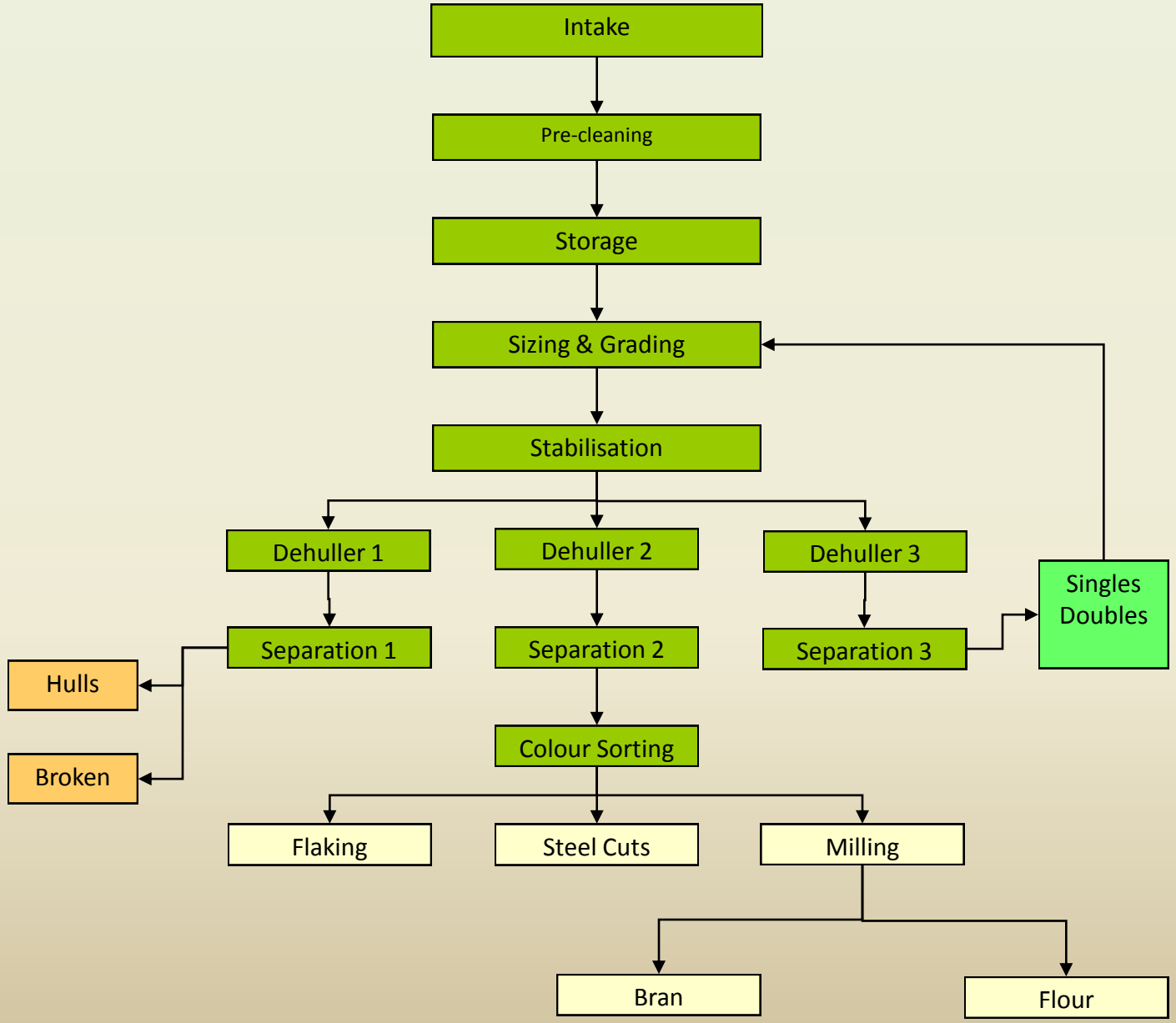
Source: Helen Pearce - Organic Research Centre

Trial yields are often higher than those achieved commercially

Production: Organic Credentials

- Oats have a great ability to outcompete weeds,
- Perform well in low fertility situations
- Low input
- pH/soil type tolerant
- Exceptional nutrient scavengers
- Good disease resistance
- UK Bred varieties (IBERS)

Human Food: The Oat Mill



The Human Food Market

- Small market
- Very reactive to supply/demand ratios
- UK either an exporter or importer
- High cost when compared to other cereal ingredients
- Lack of provenance
- The ‘free range V organic chicken’ syndrome
- Really suited to high value products
- ‘Volume’ in the hands of the supermarkets

Animal Feed

Comparison of Wheat and Oats			
		% As Fed	
		Husked	Naked
Nutrient	Wheat	Oats	Oats
Crude protein	11	9.1	10.3
Oil (B)	2.3	6.8	10
Crude fibre	2	11.3	2.5
Lysine	0.31	0.35	0.42
Methionine	0.17	0.14	0.2
Cystine	0.25	0.26	0.3
Meth.+Cyst.	0.43	0.4	0.49
Threonine	0.31	0.28	0.33
Tryptophan	0.13	0.11	0.16
Arginine	0.52	0.55	0.65
ME MJ/kg	13	10.5	15

Oat protein has a much better amino acid profile than wheat.
Basically in poultry diets 10% protein in oats is the equivalent of 12% in wheat. This means that it results in circa 2% less protein's worth of nitrogen going out the backside of birds into the environment when oats are fed rather than wheat.

Dr Cliff Nixey

Organic Oats For Animal Feed

- Volume Market
- Value related to wheat/fat
- Compounders resistance
  - Bin/handling problems
  - Perceived energy values
  - Lack of supply (!)
  - No perceived added value

The Livestock Adviser's view – EBLEX

(Beef and Sheep)

I use oats as a cereal to balance diets in several commercial goat herds and quite a few beef herds are using oats where they have been grown on that farm.

In the past I have used oats quite heavily for high yielding dairy cows ***as they are far safer and kinder on the rumen than wheat or barley. However, at the moment I am not using Oats on any cow dairy farms as bushel weights of Oats were looking poor last summer*** *when we buying the current winters feed, although they ended up being good it was too late as other feeds had been bought. As other diestible fibre sources such as soya hulls and beet pulp are now very expensive I expect I will advise use of more oats over this summer.*

We do find sourcing oats to buy to be quite difficult at times and the feed trade very rarely use them*. They do usually work out as* ***good value for money if it is a good sample*** *and because we can feed them whole to sheep and cattle under 12 months old they do save a processing charge.*

I use and advocate using oats in a range of beef and sheep rations.

Great feed in the right rations and a great feed for rumen stability

I have very few clients using oats, those that do use in calf rations, and the occasional one in finisher diets used with wheat, but ***generally quality is low so therefore not giving much energy. I have no clients that use oatfeed****, or oat wholecrop*

Whole oats / coarsely rolled oats work well in calf / lamb home-mix diets, useful fibre level & high oil content. Also can work in some dairy diets to lift b/fat.

Oats do not feature in any conventional diets I do now - due to availability and variable quality.

Oats for Animal Feed

- Quality Protein/ good fat levels
- Value Added Components
- Locally grown
- Good organic credentials
- Quality grain supply
- Naked Oats for monogastrics and husked for ruminants?

"Buying British buying local might also underpin an (organic) resurgence in some areas and with some values chains."

Anonymous

Oats for Industrial Uses

- Organic market in cosmetics is small but growing
- Competes against NATURAL (The largest sector)
- Products tend to be extremely expensive
- Industry drive towards active natural molecules makes organic certification extremely difficult
- Very small volumes but high value

The Role of Research

- Improved agronomic performance
- Better milling characteristics for the oat miller
- Improved animal feed quality
  - Naked oat/husk oat/thin/husk oats
  - Fat
  - Valued-added Components
- Improved/understood environmental impacts
  - Carbon footprint
  - CO2/Methane issues

Opportunity or Irrelevant

- Oats and the Organic Movement share similar threats and opportunities!
- A well-suited Organic crop to grow with good credentials
- Human Food market is restricted and unlikely to change
- Animal production offers opportunities both for the vertically integrated livestock producer
- *…… and the feed compounder (If willing!)*

- *Research will create the opportunities!*