

Better Farm Crops Programme



Programme Report 2010-2012/3

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Special thanks to:

Teagasc greatly appreciates the openness; cooperation and enthusiasm of all the BETTER farms through the program and Teagasc extend our appreciation to each BETTER farm family. Also a special thanks to the dedicated staff within Teagasc KT and Research for their hard work in seeing the program through to the end.

Summary

The Crop BETTER farms were set up with the aims of improving technology transfer to farmers on a regional and national basis. Three farms were selected to match the resources available. The initial interviews with each farmer highlighted the main areas of concern and the aims of the farming family for the period of the programme. Areas which surfaced on all farms were increasing yields, lowering costs, access to an additional affordable land base to facilitate expansion, land fragmentation, soil nutrient supply and succession issues.

The farming families involved in the BETTER Farm program are the Crowleys in Cork, O'Donoghues in Meath and Williamsons in Wexford. Two of the farms rent over 80% of their land and two farms have a continuous cereal cropping system. All are farming in excess of 130 hectares.

The BETTER farm crop program used the concept of many "small adjustments" to improve the profitability and sustainability of the tillage systems on three farms from 2010-2012.

A financial analysis of each farm was completed and each farm was above the National Farm Survey (NFS) average for individual crops and in many cases profits exceeded that of farmers in the top 1/3 of the NFS.

The challenge for Teagasc advisors, specialists and researchers was to maintain these high returns and stretch the farmers further while minimising expenditure.

Over the course of the three years all farms increased their returns (Common Profit) compared to the NFS top 1/3 of farmers.

The BETTER farms returned an average common profit* of €821/ha in 2010 which was 65% higher than equivalent farms (>= 100ha) in the average Teagasc National Farm Survey (NFS). In 2012 the BETTER farm average common profit per hectare reduced to €688/ha, due to a low yielding year but it was nearly 2.5 times the NFS average of farmers in the same category. These profits recovered to over €800/ha in 2013, again well ahead of NFS farms.

Increased profits were supported by increased output combined with a tight rein on costs. Farm advice revolved around small adjustments to the existing system on each farm which included; realigning the cropping program, matching crops to soil type, matching to crops sown to machinery size/deployment, agronomy changes, planning purchasing, soil nutrition, succession planning, etc.

The program particularly focused on the management of soil nutrients as national statistics show that 86% of all tillage soils are low in one or more of the major soil nutrients. Intensive soil sampling and subsequent nutrient balance calculations resulted in changes of practice on all farms. These included increased inputs of phosphate (P) and potash (K), change of N,P,K compounds, addition of organic manures and a realisation that regular soil analysis and tracking of nutrient balance is necessary.

During the program over 2000 people were directly given information about the program and/or attended farm events. 11 major research trials were on view during these farm events giving farmers in the region a chance to see and comment on major agronomic trials.

**Common profits = Grain plus straw minus Common Costs. Common Costs = all costs except hired labour, interest and land rental. Common profit is therefore used to pay for land rental, hired labour, interest and a return from the years endeavour.*



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Introduction

The Teagasc BETTER (Business, Environment and Technology through Training Extension and Research) farm crop programme was set up to assist Irish tillage farmers to avail of cutting edge farm technology and business methods, to improve profitability and to develop links between research, advice and tillage farms.

The programme focused on increasing farm output while minimising production costs through increased technology use and adoption. Generally tillage farmers are very good at adopting intrinsic (contained within the product/device) technology. As such there are no major areas where major technology developments have not been adapted (such as grassland management in the beef sector). The advisory effort concentrated in non-intrinsic technology areas such as: soil management, agronomy, forward planning in areas such as machinery replacement, business planning, material inputs planning (agrochemicals, fertiliser, etc.) with the intention of increasing margins over input costs, profits, etc. Other areas such as efficiency of the operation, land access and succession planning were also be addressed.

In terms of knowledge transfer the aims of the program was to help to make small changes to existing practice and introduce new practice (forward planning, machinery replacement policy, IPM, etc.) on each farm (rather than one or two major changes) where appropriate.

Teagasc advisors, specialists and researchers worked closely with selected farmers to help implement the latest technologies and research, thereby facilitating maximum efficiency on farms. These farms were presented as benchmark for efficient production and for transferring knowledge to other farmers.

Since 2010, over 2,000 visitors including farmers, agronomists, students and trade personnel have either directly received information about the program or attended events organised on the BETTER farms. These events were organised to be timely (within the growing season) and focussed on good practice such as financial and nutrient planning and also demonstrating the latest research results to growers locally and in the region, while also allowing feedback from end users into the crops research program in Oak Park.

Programme Objectives

The Teagasc BETTER farm crops program aims to facilitate the continuing development of tillage farming from many prospective. The objectives of the programme are;

- develop farmers capacity to generate income and/or increase efficiency to improve income and effective use of labour
- transfer knowledge to growers effectively at a local level,
 - improve and develop existing methods/practices of crop production
 - to improving the adoption of new technology on farm
- capitalise on the integration of research and advice to ensure a rapid technology transfer can take place
 - provide a two way information flow including rapid identification of research issues and opportunities.

The objectives outlined were guiding principals which the BETTER farm programme worked towards within the constraints of farmer commercial practice, Teagasc resources, commodity prices and prevailing weather.

Farmer Selection Criteria

Teagasc Better farms were located in the heart of the tillage producing areas around the country. The farms were selected under the following criteria:

- Representative of the local farming area (at least not totally dissimilar)
- Farmer maintains good farm physical and financial records willing to share this information (in a sensitive manner) with the public
- Willingness to change current practices and/or try new methods
- Open to hosting trials or demonstrations and willing to exchange views at these events
- Utilise Teagasc as the main source of information and for decision making process

All farms were selected by advisors from an existing client base and were selected as they were regarded as being good farmers who displayed good technology adoption. Three farms selected are as follows:

Table 1. Participating Better Farmers: Names and description

Area	Farmers names	Farming system
South East	Williamson Family, Duncormick, Wexford	Mixed winter and spring crops. Large area rented
North East	O'Donoghue Family, Stamullen, Meath	Winter wheat and spring barley on heavy land. Large area rented/leased
South	Crowley Family, Mallow, Cork	Winter cropping on medium ground.

At the initiation stage of the process each farmer was given an outline of the program and an indication of the type of tasks they would be involved in over the life time of the programme. During the initial consultation each farming family and their advisor outlined the main concerns/constraints for the farm in the short and medium term. These concerns were integrated into the program, where possible, in conjunction with the overall aims of the programme. The following section outlines the position of the farms and the challenges and constraints which the farmers outlined in 2010

Better Farms overview

The following section gives a description of the farmers participating in the BETTER farm crops programme.

Wexford Crops BETTER farm 2010

The Wexford Crops BETTER farm is run by George and his son Ken Williamson. This father and son operation, in South Wexford, is a typical farming operation of the area and they farm a combination of winter and spring crops with some contracting as part of their business. The soil type is mainly heavy to medium. The Williamsons rent approx. 75% of the 131 ha farmed and carry out a range of contracting services locally from ploughing and sowing cereals to beet harvesting.

The farmed area is in a relatively compact area within 8 km from the main farm yard hub.

The Williamsons grow a range of winter and spring crops on the farm with winter wheat and spring barley the largest sown areas. There is 2.7 hectares of miscanthus grown on the farm which supplies a local energy company that processes the miscanthus into briquettes for domestic use.

Table 2. Williamson farm: Land use and yields

Cropping	Area 2010 (ha)	Av. yields 2006-08 (t/ha)
Spring barley	49	7.1
Spring Wheat	15	7.5
Winter cereals	18	
Other (grass, maize, beet, hay)	50	

As part of the interview process at the start of the BETTER farm process each farming family and their Teagasc tillage advisor outlined the major constraints for the farm in the short and medium term (table 3).

Table 3. Williamson Farm: Concerns/constraints and actions identified

Williamson Family	Teagasc Advisor (John Pettit)	Actions identified
Succession planning very slow	Urgent need to help transition of responsibility to younger generation	Up-skill Ken in agronomy issues and encourage transition.
Convert the current system to a predominantly one man unit	Necessary transition for medium term sustainable farm system	Look at cropping plan and contracting business. Implications for machinery purchases
Work load in spring enormous	Unsustainable workload for both father and son especially if either party was unable to physically work	Spread workload peaks over the year by planting more winter cereals
Very variable yields from year to year	Erratic yields due to soil types and work ability in spring	Plant more winter cereals to attain higher output and stable yields
Increase overall farm output and profits	Spring cereals struggling due to long tillage rotation and heavy land	Change to winter cropping and break crops such as oilseed rape to increase first wheats.
High costs of inputs	Planning phase for material inputs too short. Not benefiting from bulk buying /forward planning	Increase planning phase and look for quotes for ag chems and fertiliser etc.
Soil nutrient status slipping	Unbalance of inputs v offtakes	Draw up nutrient plans and change fertiliser compound if necessary
Access to land	Find alternative land access mechanism	Develop Share Farming Model to help access affordable land.

The Williamsons strive to attain high yields and the physical and financial results from 2010 are outlined in table 4 . For the purposes of comparison later in the report the main crops on the farm are outlined .

Table 4 Williamson farm physical and financial crop performance 2009-2010 (S. barley and W. Wheat)

Crop	S. Barley 2009	S. Barley 2010	S. Barley NFS top ¹ / ₃ 2010	W. Wheat 2010	W. Wheat NFS top ¹ / ₃ 2010
Av. Yields (t/ha)	6.5	7.46	7.2	9.45	9.6
Variable Costs (€/ha)	436	360	467	552	554
Gross Margin(€/ha)	331	1014	738	1174	1244
Fixed Costs ¹ (€/ha)	452	474	498	595	674
Machinery €/ha	241	265	367	333	488
Net Costs ² (€/ton)	137	138	139	142	140
Common Costs (€/ton)	128	105	126	114	118

¹Fixed Costs exclude land rental

²Common Costs include all costs except land rental, labour and interest

The Williamsons yields increased significantly in 2010 and yields well above the comparable NFS top ¹/₃ of growers. Common costs were below the NFS top 1/3 by €21 per ton in spring barley (2010) and by €4 per ton in winter wheat

Meath Crops BETTER Farm 2010

Joe O'Donoghue and his brother, Colm, are full time farmers in the Meath Dublin catchment. Approximately 60% of their land is rented with most of the land in smaller parcels with the furthest land area some 25 km from the main farm hub in Stamullen, Co Meath. However a smaller farm hub is also used which reduces the distance to land at critical times during the year.

Table 5. O'Donoghue farm: Land use and yields

Cropping	Area 2010 (ha)	Av. yields 2006-08 (t/ha)
Winter wheat	101	9.9
Spring barley	143	7.23
Other (W barley, S Wheat, hay)	41	

As part of the interview process at the start of the BETTER farm process each farming family and their Teagasc tillage advisor outlined the major constraints for the farm in the short and medium term.

Table 6. O'Donoghue Farm: Concerns/constraints and actions identified

O'Donoghue Family	Teagasc Advisor (Shay Phelan)	Actions identified
Access to affordable and long term land is the biggest concern	Find alternative land access mechanism	Develop Share Farming Model to help access affordable land.
Fragmentation of existing land parcels	Consolidate land areas and reduce small land parcels	Cost the consequences of fragmentation and help to minimise transport costs
Machinery costs creeping up	Heavily reliant on two crop types which is related to land rental issues	Examine rotation and explore W Barley, WOSR
Succession planning for sons coming into business	Pathway for the transition of the younger generation needed	Identification of alternative farming opportunities
Soil nutrient status concerns	Unbalance of inputs v off takes	Draw up nutrient plans and change fertiliser compound if necessary
Increase output values	Sell more grain dried but should be costed	Increase the storage potential of farm but also explore alternative methods of sale
High costs of inputs	Planning phase for material inputs could be extended.	Regular contact to ensure correct product/timing used

The O Donoghues operate an efficient farming operation and strive to attain high yields and the physical and financial results from 2010 are outlined in table 7.

Table 7. O'Donoghue farm physical and financial crop performance 2009-2010 (S. barley and W. Wheat)

Crop	S. Barley 2009	S. Barley 2010	S. Barley NFS top ¹ / ₃ 2010	W. Wheat 2009	W. Wheat 2010	W. Wheat NFS top ¹ / ₃ 2010
Av. Yields (t/ha)	7.27	8.27	7.2	9.47	8.59	9.6
Variable Costs(€/ha)	485	546	467	813	635	554
Gross Margin(€/ha)	1100	1141	738	1062	1212	1244
Fixed Costs*(€/ha)	581	580	498	683	634	674
Machinery Costs (€/ha)	307	320	367	361	350	488
Net Costs (€/ton)	179	167	139	167	167	140
Common Costs (€/ton)	141	130	126	154	141	118

¹Fixed Costs exclude land rental

²Common Costs include all costs except land rental, labour and interest

Grain sold by the O'Donoghues is predominately dried and sold as 14% MC. Grain yields recorded by the NFS are "as sold" and are predominately off the combine. Therefore the total yields from the O'Donoghues are not directly comparable but a higher price is usually achieved post-harvest. The yield of spring barley on the O'Donoghues farm in 2010 is well above the NFS top ¹/₃ of growers. The material costs for both the wheat and barley are higher in 2010 (due to 2010 fertiliser purchased in late 2009) compared to the NFS, as fertiliser prices reduced substantially in the spring of 2010. The common costs of barley were similar on the O'Donoghues and the NFS farms but due to lower than expected yield (continuous wheat land and prone to take-all) the O'Donoghues common costs for winter wheat is substantially higher.

It should be noted the NFS top 1/3 of growers related only to the crop in question and the same grower may be in in the bottom 1/3 with another crop in the same year.

Cork Crops BETTER Farm (2010)

The Crowley farm is run on a full time basis by John and Denis (brothers) with the help of their father Denis senior. Traditionally the farm was heavily involved in sugar beet production and the loss of this crop brought about substantial change in the farming system. As well as the inevitable financial loss, farm rotation also suffered and winter cereals are now the main focus. John and Denis are the two main labour units on the farm with some additional help at harvest and planting. Therefore efficiency of physical operation is key to completing the necessary farm operations in a timely manner. Soil type varies with location across the different farms from medium to heavy. Current land use is cereals only.

Table 8. Crowley farm: Land use and yields

Cropping	Area 2010 (ha)	Av. yields 2006-08 (t/ha)
Winter wheat	202	10.0
Winter barley	121	8.6
Spring barley	61	7.5

All grain is stored and dried before sale to maximise returns. One of the main challenges on the farm over the coming years is to maintain yields with their current rotation.

As part of the interview process at the start of the BETTER farm process each farming family and their Teagasc tillage advisor outlined the major constraints for the farm in the short and medium term (table 9).

Table 9. Crowley Farm: Concerns/constraints and actions identified

Crowley Family	Teagasc Advisor (Ciaran Collins)	Actions identified
Maintain or increase yields with continuous cereals Take-all risk and decreasing soil N reserves	High dependence on continuous cereals, Yields will be at risk in a bad take-all year	To maintain Winter & Spring crops yields Take-all may be a factor Exploring OSR for rotation to increase yields
Developing marketing strategy for sale of dry grain	Given the large tonnage of grain to be sold each year a greater emphasis could be given to forward selling	Continuing to use forward selling strategy Expanded storage capacity in 2010-2012
Achieving required winter sowings in a wet Autumn	Over reliance on W Wheat and winter barley creates a huge peak work issue in the Autumn.	Last 3 seasons weather favourable OSR may spread workload Method of planting will be a factor
Reduce production costs	Production costs in line with efficient producers and this level of input is matched to high outputs. However must look at fertility levels	Forward buys fertiliser (previous year) Plans Ag-chems well in advance Tailor inputs to fields/conditions
Concern about fertility levels	Need to match crop yields with fertiliser inputs	Intensive soil sampling and complete nutrient management plans and introduce organic manures if possible

Table 10. Crowley farm physical and financial crop performance 2009-2010 for S. barley and W. Wheat

Crop	S. Barley 2009	S. Barley 2010	S. Barley NFS top $\frac{1}{3}$ 2010	W. Wheat 2009	W. Wheat 2010	W. Wheat NFS top $\frac{1}{3}$ 2010
Av. Yields (t/ha)	7.79	7.32	7.2	9.00	8.96	9.6
Variable Costs (€/ha)	547	466	467	710	643	554
Gross Margin (€/ha)	833	1289	738	571	1412	1244
Fixed Costs* (€/ha)	425	358	498	395	420	674
Machinery (€/ha)	319	217	367	354	317	488
Net Costs (€/ton)	139	140	139	123	120	140
Common Costs (€/ton)	122	110	126	121	116	118

Grain sold by the Crowleys is predominately dried and sold as 14% MC. Grain yields recorded by the NFS are “as sold” and are predominately off the combine. Therefore the total yields from the Crowleys are not directly comparable but a higher price is usually achieved post-harvest. Crowleys cost structure in both material and fixed costs in spring barley are well below the NFS top 1/3 of growers reflecting in a Common costs of €16/t lower than the NFS group. The Crowley’s winter wheat is grown as continuous cereals and identified at the start of the program as a potential problem if take-all becomes a problem in specific years. As continuous wheat, lower yields would be expected compared to first wheats (many of the crops in the NFS top 1/3 data are probably first wheats, however the data to confirm this is not available). Despite the lower yield the cost base on the Crowleys farm is lower than the NFS group resulting in a higher Gross Margin and lower Common Cost.

Physical and financial report 2010-2013

Background

Tillage farming is highly dependent on both prevailing weather and market volatility. Both factors can have a large influence on the physical output, costs and profitability of crops in any given year. In order to give context to flocculating yields on the Better Farms (BF) table 11 outlines the national average yields and price for each of the years.

Table 11 Evaluation of indicator crops and price for 2010-2013

		2010	2011	2012	2013
Winter Wheat	Yield t/ha ¹	8.9	10.2	7.4	9.3*
	% Yield difference ³	+3%	+15%	-27%	+26%
	Winter Wheat yield €/t ²	157	166	210	162
	%Price difference ⁴	+22%	+19%	+26%	-22%
Spring Barley	Yield t/ha ¹	6.7	7.5	6.2	7.1*
	% Yield difference ³	+10%	+12%	-17%	+15%
	Spring Barley price €/t ²	147	158	200	150
	%Price difference ⁴	+20%	+20%	+26%	-25%

¹ CSO National average yield

² Green (@85% DM) price paid (Average merchant price: Source J O'Mahony Teagasc)

³ Yield difference in the year compared to previous year

⁴ Price difference in the year compared to previous year

* Teagasc Harvest Report 2013

BETTER Farm Financial Details

Financial details of the farms were recorded for three years (10-12) during the core phase of the program. Both years either side of the program were also recorded. An average performance of all three farms is presented to give an overall view of the progress made on farms over the program.

During the three years the weather had a large influence on yield and all three growers used forward selling of grain to try to minimise volatility (and maximise returns).

This report looks at the overall costs and returns from the main tillage enterprise on each farm (this represents over 95% of the farm return on each farm). Two of the three farms have very small livestock enterprises. In as much as was possible costs associated with other farm enterprises or machinery contracting for hire completed by the growers are excluded.

This report looks at three indicator crops (Winter Wheat and Spring Barley and Winter Barley) on each farm to track progress across the three years. Figures are compared within each year to the NFS data as this data set provided the a continuity of farmers over the period.

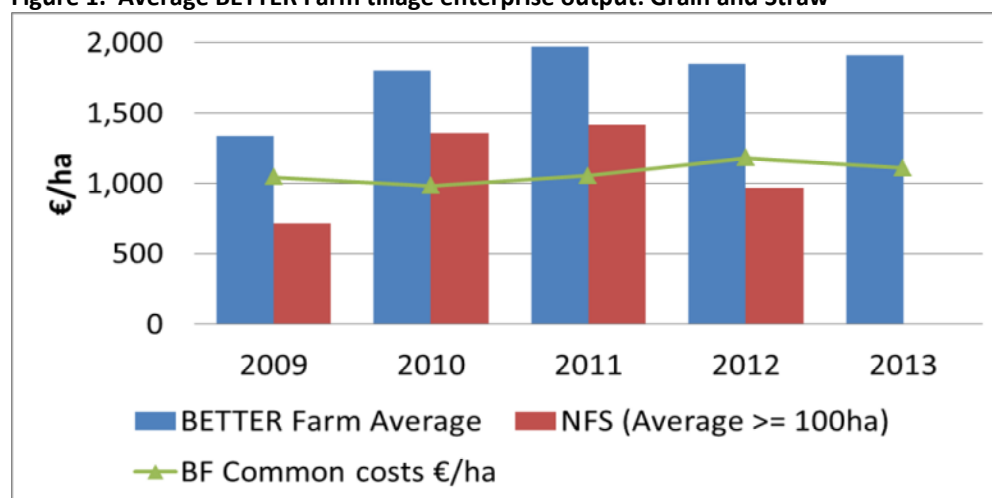
Common Costs and Common Profit figures are presented due to the diverse nature of how each farms gets access to their land base (from a predominantly all owned to a farm with almost all rented land). As with the NFS data all sales are recorded as

sold (wet or at 14-15% MC). Common Costs and Common Profits were deemed to be the most stable indicators to track progress on the farms. Common Costs include all tillage costs but excludes labour, interest and land rental. Common Profit is Gross Output minus Common Costs. All Direct Payments are excluded from the calculations as production is not dependent on the level the payment.

Tillage enterprise performance

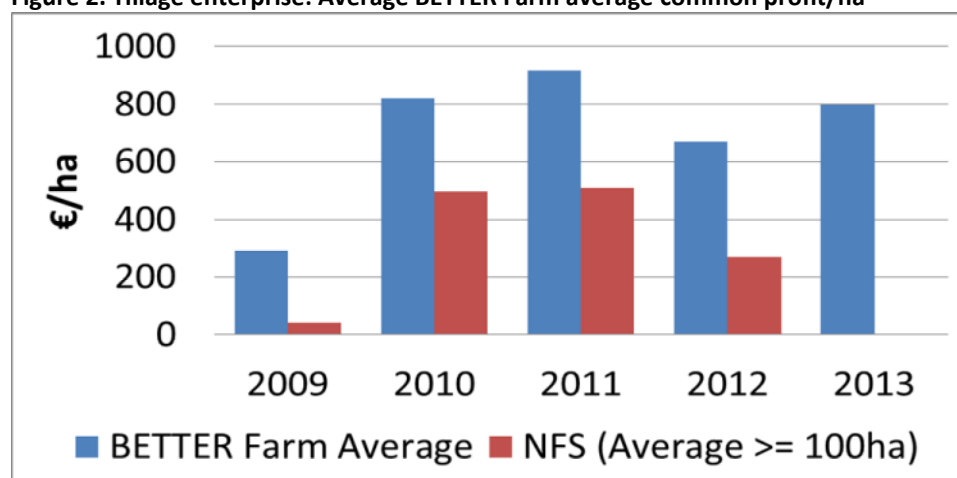
All material and fixed costs were recorded and monitored on each farm through the programme. These costs were captured using the Teagasc e-CROPs or on paper and then inputted into the Teagasc e-Profit Monitor online programme. This enabled costs to be compared across farms and also with the National Farm Survey (NFS) data. It was decided that a comparison of the BF figures with the National Farm Survey (NFS) data from year to year is more consistent, as opposed to the e-Profit Monitor data. The group data in the NFS is more consistent (as most of the same farmers financial data are included each year) over time than the e-Profit Monitor data.

Figure 1. Average BETTER Farm tillage enterprise output: Grain and Straw



The farms increased output from 2009 to 2011 with a combination of higher yields and price however lower yields (weather related) decreased outputs in 2011 (Figure 1). The output recovered somewhat in 2012 but wheat yields were lower on all farms (again weather related). The output increased in 2013 with increased yields but did not surpass 2011 due to a lower average price achieved. The performance of the BETTER farms outstripped the relevant group on the NFS (the group with 100ha or more) in all the years despite differing weather and yield patterns. The average common costs on the BETTER farms increased from 2010 to 2013 by 13%.

Figure 2. Tillage enterprise: Average BETTER Farm average common profit/ha



The average Common Profit from the BF exceeds the common profits from the comparison NFS group over the period. The BF average common profit increased from €294/ha in 2009 to a peak of €916/ha in 2011 and dropped to €801/ha in 2013. The 2013 common profit represents an increase of over 250% compared to 2009 but a 2.5% decrease from 2010. It must be noted in 2009 average yields were poor and the average grain price achieved was quite low (see table 11). From 2010 to 2012 the gap between the BF and the average NFS farms increased from €326/ha to €398/ha, an increase of 22% over the period.

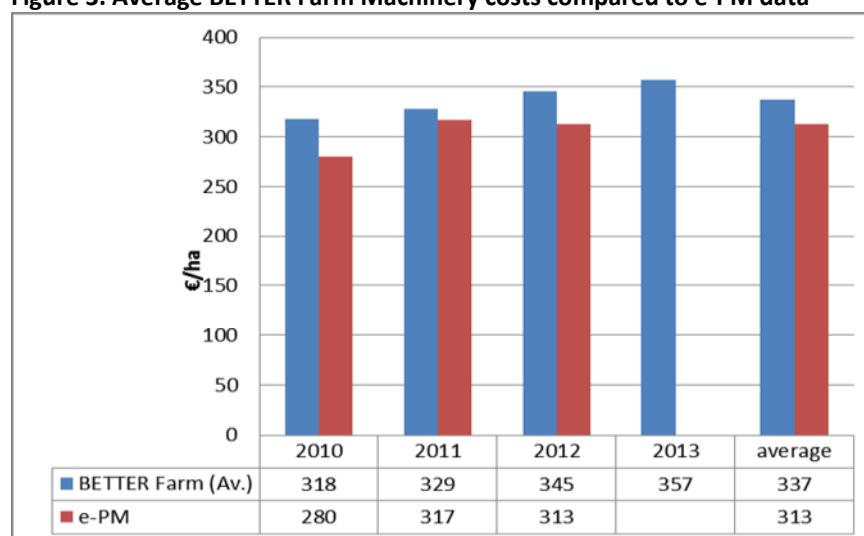
Machinery Costs

During the BF programme all farmers analysed their machinery costs. The Machinery Cost Calculator used by KT advisors was updated periodically over the period so that farmers could more clearly understand the output figures and implications of their machinery spend.

The Machinery Costs Calculator captures the costs associated with the machinery on the farm. Costs captured include depreciation of each machine which is calculated by original machine costs minus the residual value spread over the life of the machine on the farm. All other costs such as diesel, repairs, contracting in, and associated costs are recorded. The program can exclude costs incurred by other farm enterprises or contracting out.

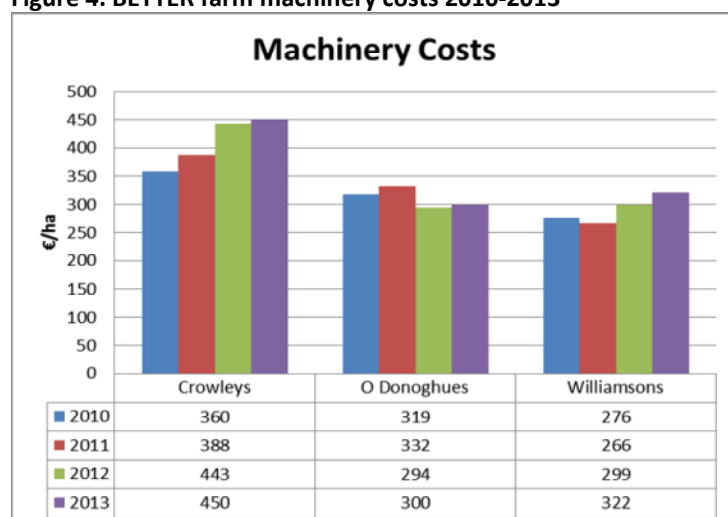
Individual machinery costs can be compared to other farmers data by inputting the data into the e-Profit Monitor programme. It was not possible to compare machinery costs to the NFS data as the NFS figures are recorded differently. The

Figure 3. Average BETTER Farm Machinery costs compared to e-PM data



The Machinery costs shown in Fig 13 indicates an increase in BETTER farm machinery costs of 8.5% over the period 2010 – 2012, a similar increase can be seen on the e-Profit Monitor data. The CSO fuel inflation figures show a 22.4% increase in diesel between 2010-2012 and accounts for some of the cost increase over that period.

Figure 4. BETTER farm machinery costs 2010-2013



There was a general increase in the Crowley’s and Williamsons costs over the period. Some of the increases was due to increased fuel costs and the rest is due to reinvestment in machinery. The O Donoghues machinery costs stabilised, despite reinvestment, which was due to an increased tillage area of 17% over the period. The O Donoghues costs compare well to the e-pm average machinery costs despite running a very fragmented holding, working on heavy land and the inclusion of a grain dryer in their costs.

The Crowleys Machinery Costs is higher than average as some major reinvestment (combine, grain dryer) was carried out in the period. It should be noted these costs includes the costs associated with a lorry. The lorry accounts for approximately €60/ha of the total costs each year on the farm. The costs associated with the lorry are counteracted by increased revenue from grain and straw and are reflected in the higher common profits.

Individual crop performance

Winter Wheat

Winter Wheat performance on the farms from 2009 to 2013 was variable with price and yield in 2009, 2011, 2012 heavily influencing yields, gross output and profits.

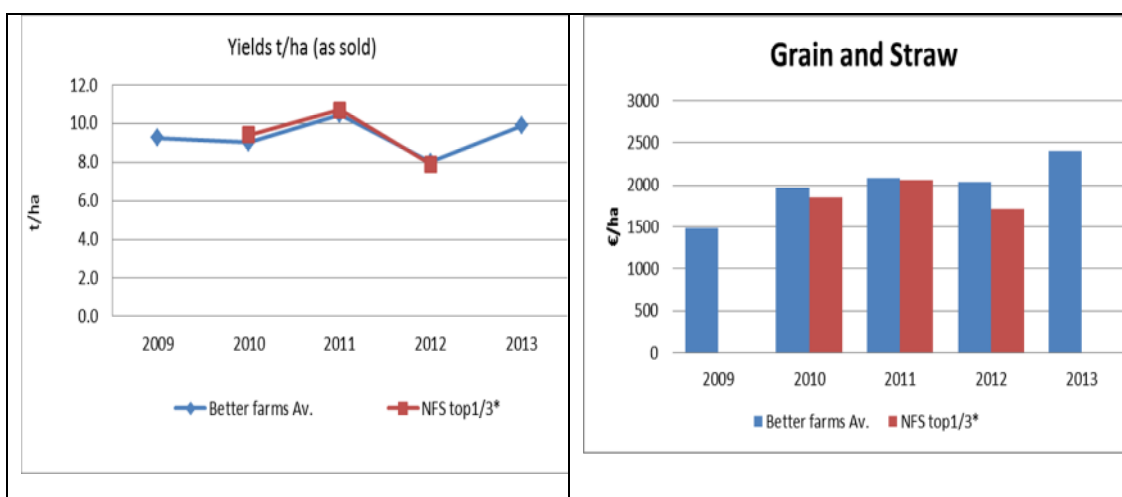


Figure 5. Yields of winter wheat

Figure 6. Winter wheat: Grain and Straw

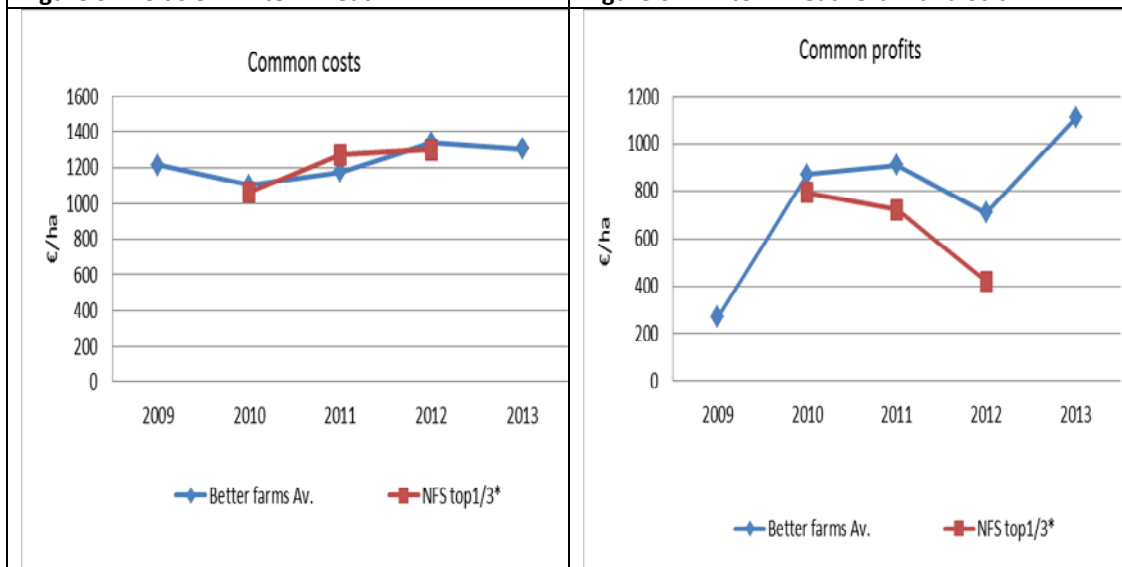


Figure 7. Winter Wheat Common Costs

Figure 8. Winter Wheat: Common Profits

*NFS based on family farm income (top1/3)

Note: Most of grain from BETTER farms is sold @15% MC

The results contained in figures 5 to 8 show that the Better Farms maintained their advantage (output and common profit) over the NFS top 1/3 farms from 2009-2012. Yields recorded are “as sold” and the majority of wheat sown on the BF is sown as continuous wheat (which is generally lower yielding than first wheats). The BF achieved a higher price for grain (reflected in a higher gross output) as most of the grain was sold dried (MC 15%).

Common costs increased by 21% in both the BF and the NFS from 2010 -2012. During the same period common profits decreased on the BF by 9% compared to a drop of 47% on the NFS farms. Common costs dropped by 2.5% in 2013 compared to 2012 on the BF. The BF increased the profit differential over the NFS top 1/3 of farmers to €289/ha in 2012, with a total common profit of €708/ha from winter wheat. The common profit on the BF increased to €1,109 in 2013.

Spring Barley

As with winter wheat prevailing weather and price had a huge influence on profitability of spring barley.

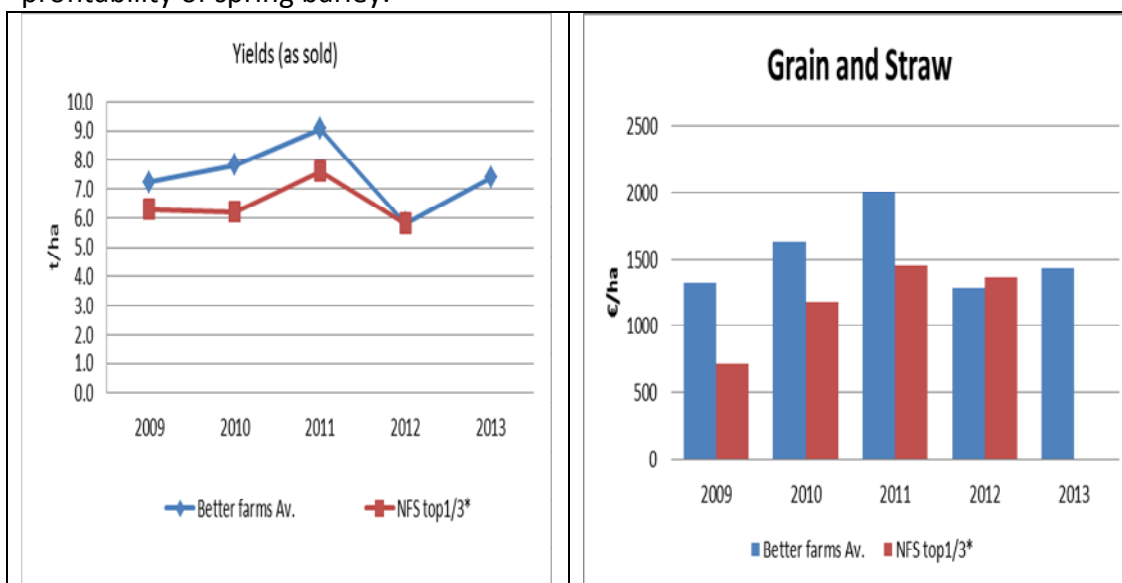


Figure 9. Yields of Spring Barley

Figure 10. Spring Barley: Grain and Straw

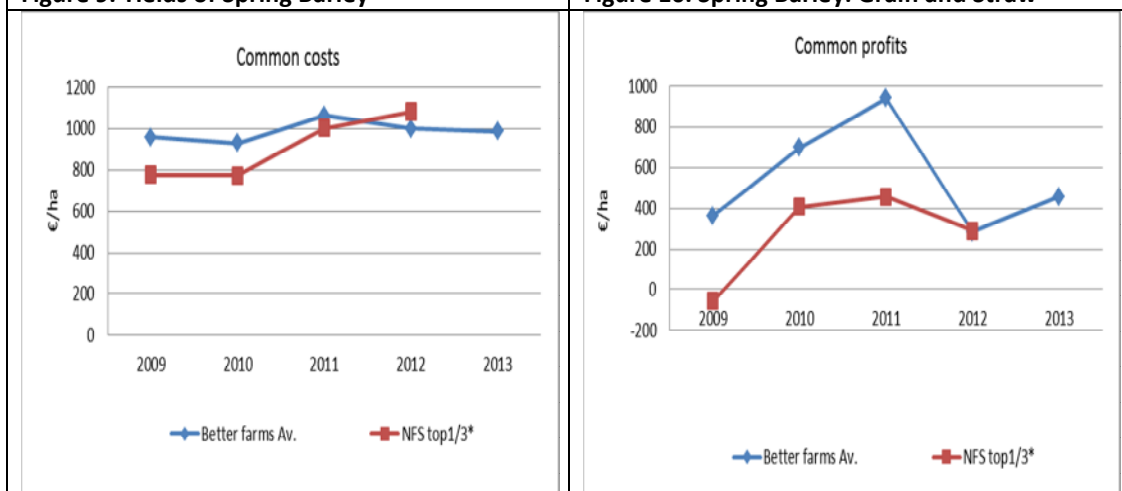


Figure 11. Spring Barley Common Costs

Figure 12. Spring Barley: Common Profits

*NFS based on family farm income (top1/3)
 Note: Most of grain from BETTER farms is sold @15% MC

The results contained in figures 9 to 12 show that the Better Farms maintained their advantage (output and common profit) over the NFS top 1/3 of farms in all years except 2012. Yields recorded are “as sold” and the BF achieved a higher price for grain (reflected in a higher gross output) as most of the grain was sold dried (MC 15%). However due to reduced yields on the BF and more grain being sold directly from the combine (as the proportions of spring barley as a proportion of the total

cropped area on farms change each year) in 2012 the BF could only match the common profits from the NFS top 1/3 of growers.

Common costs increased by 7% on the BF but increased by 39% on the NFS farms from 2010 -2012. During the same period common profits decreased on the BF from €698 to €284 (drop of 60%) compared to an decrease from -€407 to €289 (drop of 29%) on the NFS farms. With the exception of 2012 the BF maintained an average profit differentiation over the NFS farmers of €296/ha.

Winter Barley

Winter Barley proved to be the most consistent crop on the farms over the three year period. Crowleys can be considered specialist growers and have developed a specific (and higher value) market for their straw. As a result the returns from Crowleys returns are very high from this crop. Winter barley was introduced onto the O'Donoghues and Williamsons farm in 2010 and both growers recognised the profitability and its ability to spread workload and better match machinery capacity to the peak workloads.

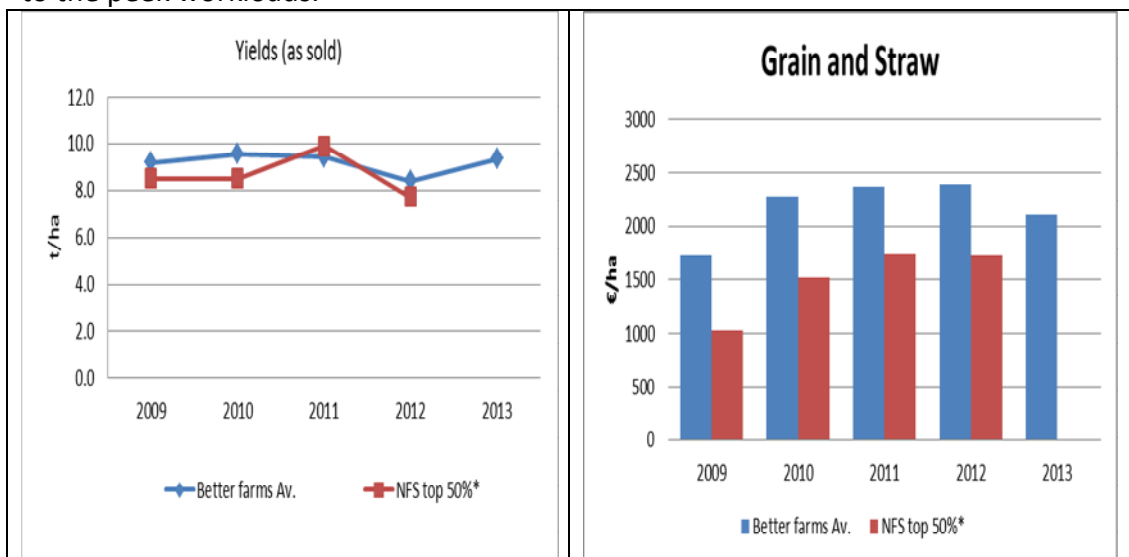


Figure 13. Yields of Winter Barley

Figure 14. Winter Barley: Grain and Straw

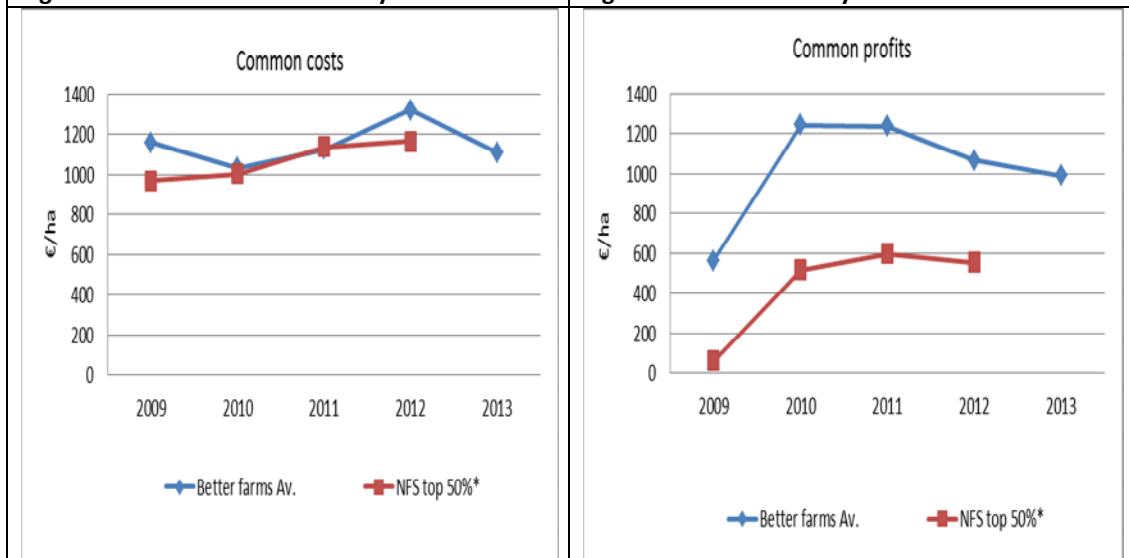


Figure 15. Winter Barley Common Costs

Figure 16. Winter Barley: Common Profits

*NFS based on family farm income (top1/3)

Note: Most of grain from BETTER farms is sold @15% MC

The results contained in fig 13 to 16 show that the BF maintained a strong differentiation (output and common profit) over the NFS top 50% of farms from 2009-2012. Yields recorded are “as sold” and the majority of barleys sown on the BF is sown as continuous barley. The BF generally achieved a higher price for grain (reflected in a higher gross output) as most of the grain was sold dried (MC 15%). During the same period Common Profits decreased on the BF from €1,224 to €1,067 (drop of 12%) compared to an increase from €517 to €556 (7% increase) on the NFS farms. The BF maintained an average profit gap over the NFS farmers of €625/ha over the period.

Note: the comparison was made to the top 50% of farms on the NFS (as opposed to the top 1/3) due to sample size.

Progress to address on farms concerns/constraints

At the start of the programme each farmer was asked to identify the major constraints or concerns for the farm in the short and medium term. All of these concerns/constraints were noted and an action identified to address each concern. A summary of the actions taken are presented in table 12-14. Many of these actions directly affect each farmer in the short term and others will take some time to implement or fully embrace to the farms. Many of these actions may not directly affect profit in the year in question or indeed for a number of years but should help to put the farm on a solid footing e.g. succession issues, etc. However each action helped to address the sustainability of the farming system and reflects the background Knowledge Transfer each advisor completed with their clients.



Williamson Family farm

Table 12. Summary of the Concerns/constraints, and actions taken to address these concerns

Williamson Family	Teagasc Advisor (John Pettit)	Actions identified	Actions undertaken 2010-2012	Areas yet to be addressed for the future
Succession planning for the future is very slow	Urgent need to help transition of responsibility to younger generation	Up-skill Ken in agronomy issues and encourage transition.	Progress with family settlement for Ken and other members of the family. Ken has taken over the fertiliser application and a more active role in farm management and planning	For Ken: - Further development of role in medium to long term planning. Sprayer training as part of SUD necessary Continued encouragement of both George and Ken to jointly make decisions about all areas of the business
Convert the current system to a predominantly one man unit	Necessary transition for medium term sustainable farm system	Look at cropping plan and contracting business. Implications for machinery purchases	Substantial progress made to change to winter cropping. More efficient system with increased flexibility and now more a suitable to one man system	Increased streamlining of the farming system needed, perhaps alternative crop establishment system. Still heavy reliance on contracting which may be distracting from core activities (especially management and handover)
Work load in spring enormous	Unsustainable workload for both father and son especially if either party was unable to physically work	Spread workload peaks over the year by planting more winter cereals. Land to winter cereals as % of overall tillage crops has increased from 23% (2010) to 60% in 2013-14.	Greater reliance on winter cropping has reduced peak workload in spring 3 year average Common Profit from winter wheat v spring barley (+€265/ha in favour of winter despite a very poor yield of wheat in 2012 to weather)	Contracting may be filling the gap and keeping the peak workload in spring very high. Careful management and evaluation needed
Very variable yields from year to year	Erratic yields due to soil types and workability of heavy soils in spring not suitable for spring cereals	Plant more winter cereals on heavier soils to attain higher output and stable yields	Targeted land suitability to winter/spring cropping. Heavier land now in winter cropping. Spring crop yields more stable	Rotation needs careful management. Inclusion of oilseed rape has helped.
Increase overall farm output and profits	Spring cereals struggling due to long tillage rotation and heavy land	Change to winter cropping and break crops such as oilseed rape to increase first wheats.	The change to winter cropping rotation has addressed this issue	Careful assessment of the winter yields and build in a rotational crops are essential
High costs of inputs	Planning phase for material inputs too short. Not benefiting from bulk buying	Increase planning phase and look for quotes for ag chems and fertiliser etc.	A more targeted approach to ordering and pricing agchems before the season resulted better use of time and overall approach	Continued attention to yearly purchases and planning needed to ensure slippage does not occur.
Soil nutrient status slipping	Unbalance of inputs v offtakes	Draw up nutrient plans and change fertiliser compound and crop choice where necessary	Soil testing and nutrient plans completed to ensure adequate fertility on fields. Change of core compounds necessary and rate increased were needed. Targeted winter crops to low fertility status soils	Build up on many fields has begun which will take time. Continued planning and choice of nutrient balance necessary
Access to land	Find alternative land access mechanism	Develop Share Farming Model to help access affordable land.	Looked at setting share farming with existing land owners but negotiations ongoing. Bank of land identified for long term lease	Long term lease agreement for large land bank identified and negotiated
New opportunities				
New constraints		Winter cropping rotation needs to be examined as over reliance on winter oats and associated risk of Oat Mosaic	Targeted oilseed rape to substitute some of the oat acreage. More profitable crop in 2012 €422 /ha over other oat margin crops	All alternative crops must be evaluated and sound rotation with these crops will increase overall profitability. More beet/maize or beans



		Virus		or oilseed rape
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O'Donoghue Family

Table 13. Summary of the Concerns/constraints, and actions taken to address these concerns

O'Donoghue Family	Teagasc Advisor (Shay Phelan)	Actions identified	Actions undertaken 2010-2012	Areas yet to be addressed for the future
Access to land is the biggest concern	Find alternative land access mechanism	Develop Share Farming Model to help access affordable land.	Increased farm sharing arrangements by 100% which encompasses 15% land area. Long term lease increased by 100% and land area now at 5% of the rented land area	Long term leases or share farming should continue to be promoted over conacre for sustainable development. Target any new land (long term lease, share farming) to next generation.
Fragmentation of existing land parcels	Consolidate land areas and reduce small land parcels	Cost the consequences of fragmentation and help to minimise transport	The costs of fragmentation were calculated (using one crop) but underestimated the true costs due to one crop scenario. Continued efforts to consolidate land areas but progress is slow	Linked to land access issues but targeting of larger blocks closer to identified bases should be more vigorously pursued
Machinery costs creeping up	Heavily reliant on two crop types.	Examine rotation and explore W Barley, WOSR	Winter barley established in rotation @10% of area in 2013. Machinery costs contained despite planned machine changes. Costs per hectare reduced by 8% per hectare from 2010-2012 partially due to 17% increase in area	Expand winter barley acreage to further spread peak work loads. Oilseed rape could also be considered to spread peak work loads. Further examine alternative to tractor & trailer grain haulage at harvest
Succession planning for sons coming into business	Pathway for the transition of the younger generation needed	Identification of alternative farming opportunities	Progress has been made with gradual hand over of some responsibilities to the sons. Further progress and a plan is needed for new generation Expansion of hay/straw market continuing.	Extra income needs to be identified to support at least 3 families in the medium term. A plan must be formulated to make this happen over the next 2-3 years. Serious consideration to alternative enterprises on the farm must be examined
Soil nutrient status concerns	Unbalance of inputs v offtakes	Draw up nutrient plans and change fertiliser compound if necessary	Soil testing and nutrient plans completed to ensure adequate fertility on fields. Soil testing and nutrient plans completed to ensure adequate fertility on fields. Identified lower yield fields and is now importing organic manures to help address the situation	Due to the unstable land base it is difficult to adequately plan for long term nutrient status of land. Continued use of organic manures is encouraged especially in low fertility sites of owned land
Increase output values	Sell more grain dried but should be costed	Increase the storage potential of farm but also explore alternative methods of sale	Have increased used forward trading to increase average selling price. Increased grain storage capacity.. Increased straw income by 52% from 2010 to 2012	Continue to look at forward selling but also increase the copping mix to spread risk. Potential to look at niche crops with a bonus. Develop straw and hay business further.
High costs of inputs	Planning phase for material inputs could be extended.	Regular contact to ensure correct product/timing used	Material costs continue to increase but advisor input reduced over the period due to time constraints.	Over reliance on insurance factor for many agro-chemical applications. Reduce reliance on merchant advise where a very conservative approach is taken. Better crop rotation can help reduce total spraying days for a given crop at critical timings. Greater reliance on Discussion Group for steering agronomy decisions. Increase forward planning of material inputs
New Opportunities			CAP greening rules may affect share farming capacity and viability due to multiple crops	



New Constraints			SFP change over and land lease???	
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Crowley Family

Table 14. Summary of the Concerns/constraints, and actions taken to address these concerns

Crowley Family concerns 2010	Teagasc Advisor (Ciaran Collins)	Actions identified	Actions undertaken 2010-2012	Areas yet to be addressed for the future
Maintain or increase yields with continuous cereals Take-all risk and decreasing soil N reserves	High dependence on continuous cereals, Yields will be at risk in a bad take-all year	Can winter crop yields be maintained Take-all a factor in 2011. Exploring OSR for rotation to increase yields however we must be mindful of efficiencies of the operation to get the work completed around sowing and harvest.	Explored rotations with the Teagasc rotation planner. Oilseed rape was introduced in 2012.	Overall the farm has a high exposure to cereals and where price and yields are low in the same year this exposure increases. If septoria becomes too costly to manage then a total farm cropping system will have to be evaluated
Developing marketing strategy for dry grain	Given the large tonnage of grain to be sold each year a greater emphasis could be given to forward selling	Continuing to use forward selling strategy Expanded storage capacity in 2010	Strategy for selling grain as to maximise price but roughly as follows 10% at harvest 70% around the New Year 20% late spring Expanded grain store capacity to match farm output in 2011 and expanded the grain dryer capacity in 2012	Steady progress is being made in this area
Achieving required winter sowings in a wet Autumn	Over reliance on winter wheat and winter barley creates a huge peak work issue in the Autumn.	Last 3 seasons weather favourable OSR to be explored to help spread workload Method of planting will be a factor	Ploughing commences immediately after harvest and drilling streamlined to maximise window for ideal planting timings	Large reliance on hired tractor and if this was unavailable additional machine purchases may be necessary or a contractor used
Concern about fertility levels	Need to match crop yields with fertiliser inputs	Intensive soil sampling and complete nutrient management plans and introduce organic manures if possible	Identified a slippage in P and K using standard fertiliser program. Upped potash use rates by 20% per year	Continue to monitor soil levels with regular soil tests and adjustment of inputs where necessary
Reduce production costs	Production costs in line with efficient producers and this level of input is matched to high outputs. However must look at fertility levels	Forward buys fertiliser (previous year) Plans Ag-chems well in advance Tailor inputs to fields/conditions	To react to changing disease threat from septoria fungicides costs have increased in winter wheat to support high yields However production costs are still below the average.	If septoria control becomes more challenging then costs will increase Weakness of the system, is the loss of nitrogen from the organic manures taken in the autumn (oilseed rape could help here)
New Opportunities			Land purchases in the past 2 years has increased the land base.	More land purchases are possible.
			Farm was converted to a limited business in 2012	Opens up possibilities for the business to build capital for new expansion in the future
			Straw market	Can it be developed further??
New Constraints			SFP changes	Loss of income due to reductions (possibly 25%)

Challenges (areas where progress can still be made)

A number of challenges exist on the BF and are largely reflective of the issues on most tillage farms through the country. Most of these challenges are highlighted in table 12-14 and the actions taken to date. The type of farming system or type of land access can dictate the pace of change and any change undertaken must be carefully managed so that the overall family income is maintained. This has been the case with some of the major constraints identified by the BF. The following are areas where all the farms continue to push change so that their farms are on a more solid footing:

- Two of the three farms reported that land access is a major constraint to the farm development. Teagasc made progress with the development of share farming and both farmers have enthusiastically embraced the concept and are either operating some of their holding under this arrangement or negotiating new arrangements. However more progress is needed by these farms to reduce the risks associated with the conacre rental system.
- In two of the three farms main production areas comes from monoculture (winter wheat or winter barley or spring barley) rotations. In any given year take-all can negatively influence yields thus dragging profitability. Better rotations would help stabilise yields and overall margins. New regulations as to the number of crops grown (“Greening Rules”) may affect this practice in the future. This can be looked upon from a positive point of view in the long term as break crops can help to increase/maintain high yields in cereals thus increasing sustainability.
- Two out of the three farms have immediate farm succession issues which need to be addressed carefully. Both farms have made some progress in this area but more is needed in terms of planned asset transfer and management of day to day activities

Areas outside the control of the farms

As with all farming weather plays a major role in the eventual profitability. By its very nature crops react in growth patterns to the weather events (dry, wet, dull, sunny, etc.) and the eventual yield is directly affected by the prevailing weather. Even though the BETTER farmers are technically proficient at growing crops their crops are equally effected by the weather. However, as stated in financial farm details section, yields were variable from year to year but the BF generally performance above the NFS top 1/3 of farmers each year.

Grain prices in Ireland are dictated by world commodity prices and tillage farmers in Ireland have very little influence on the final farm gate price. Two of the three farms have developed local markets with pig producers and are achieving higher prices than those from a local merchant but the price obtained is still linked to the world grain price.

Knowledge Transfer activities

The aims of the project are to promote technology adoption by the Better Farms, local farmers and farmers in the wider region. In order to achieve this many activities were undertaken and are outlined in table 15. Specific events and actions are relatively easy to identify but more subtle transfer from advisor to farmer based on the experience/research results of the Better Farms has been identified as a major output.



Table 15. Summary of Knowledge Transfer activities

Date	Event name	Activity	Output	Attendance
Jun-10	Open Day – Wexford	Results Financial, Agronomy oilseed rape, IPM, DSS cereals agronomy, DAFM trials, Cross Compliance Nutrition, Fungicides, Soil management,	Booklet, Slides, Client site	170
Jul-11	Cereal Farm Walk (Wexford)	Johnstown Cereal Group Meeting. Viewing all trials and discussing implications for on farm practice		35
Jun-12	Open Day – Wexford	Results Financial, Agronomy oilseed rape, IPM, DSS cereals agronomy, DAFM trials, Cross Compliance Nutrition, Fungicides, Soil management,	Booklet, Slides, Client site	250
Apr-09	Discussion Group (Wexford)	Johnstown Tillage. Winter cereal agronomy, varieties and crop selection for the spring	Crop agronomy hand out	9
Jul-09	Discussion Group (Wexford)	Johnstown Cereal Group Meeting. Viewing all trials and discussing implications for on farm practice	Crop agronomy hand out and trials information	15
May-12	Discussion Group (Wexford)	Tillage Agronomy Group – Johnstown Castle Cereal. Viewing all trials and discussing implications for on farm practice	Crop agronomy hand out and trials information	40
May-13	Discussion Group (Wexford)	Johnstown Tillage Agronomy Group. Viewing all trials and discussing implications for on farm practice	Crop agronomy hand out and trials information	15
Jun-13	Discussion Group (Wexford)	Johnstown Cereal Group. Agronomy of all crops and viewing of trials	Crop agronomy hand out and trials information	19
Aug-13	Discussion Group (Wexford)	Johnstown Cereal Group Meeting Agronomy of all crops and viewing of trials	Crop agronomy hand out and trials information	13
Jul-13	Farm walk by international visitors (Meath)	Part of international Knowledge Transfer Conference	Handout and boards	45
Feb-August 2011	National Media	Irish Farming Independent: Series of articles covering activities on the farm	Media articles	National Publication
Feb-July 2012	National Media	Irish Farming Independent: Series of articles covering activities on the farm	Media articles	National Publication
Jan-11	National Tillage Conference	Conference paper outlining the program to date and results	Conference paper	500
Jan-14	National Tillage Conference	Conference paper outlining the program to date and results	Conference paper	500



Jun-10	Open Day Cork	Aims, Financial, DSS systems, Agronomy cereals, DAFM, Nutrition, Fungicides, Soil management, grain storage	Booklet, Slides, Client site	200
Jun-12	Open Day Cork	Results Financial, Agronomy oilseed rape, IPM, DSS cereals agronomy, DAFM trials, Cross Compliance Nutrition, Fungicides, Soil management,	Booklet, Slides, Client site	200
Jun-10	Open Day Meath	Aims, Financial, Agronomy cereals, DSS systems, DAFM, Nutrition, Fungicides, Soil management, grain storage	Booklet, Slides, Client site	200
Jun-12	Open Day Meath	Results Financial, Agronomy oilseed rape, IPM, DSS cereals agronomy, DAFM trials, Cross Compliance Nutrition, Fungicides, Soil management,	Booklet, Slides, Client site	200
Apr-11	Spring Cereals Crop Walk (Meath)	Regional Crop Walk focus on agronomy of spring crop, trials.and discussion on progress and changes to farm to date	Agronomy handout and financial information	30
Feb-12	Tillage Better Farm Walk (Cork)	Regional Crop Walk focus on agronomy of winter and spring crop and discussion on progress and changes to farm to date	Agronomy handout and financial information	45
Jul-12	Tillage Crop Walk (Cork)	Viewing all trials and discussing implications for on farm practice	Crop agronomy hand out and trials information	52
May-10	Tillage Crop Walk (Meath)	Regional Crop Walk focus on agronomy of winter and spring crop.		50
Oct-11	Tillage Crop Walk (Meath)	Autumn management of crops and discussion of trial results and implications for the coming year	Agronomy handout and financial information	20
Jun-10	Todays Farm	Article on Better Farms	Description and agronomy issues	National publication to clients
May-12	Todays Farm	Article on Better Farms open days	Description of events and lessons learned	National publication to clients
Feb-11	Winter Cereal Crop Walk (Wexford)	Regional Crop Walk focus on agronomy of winter and spring crop.and discussion on progress and changes to farm td date	Agronomy handout and financial information	30
	National Media/Todays farm	Mark Plunkett soils		
	Presentation at conference USA	Mark Plunkett soils		

Research activities

During the BETTER farm programme a substantial amount of research was carried out on each farm. These trials performed to functions : firstly it brought research outside core research centres (Oak Park) and secondly allowed a hands on look at the research by farmers in the in each region. These plots were used extensively by local advisors for discussion group meetings and as a reference point for advisory work in their area. Farmer reaction (from direct questionnaires and from farm organisations) was extremely positive towards trials at a local level.

The fungicide and variety trials (DAFM) were particularly useful to local growers and the results directly supported key messages delivered by specialists (nationally) and advisors (locally). The following is a list of projects which had trials on the BETTER farms.

Table 16. Summary of research projects on the BETTER farms

Project name	Lead Researcher	Main objectives	Publication
Fertiliser requirements of winter wheat	Richie Hackett	-determine the economic optimum in wheat and evaluate the contribution of soil N	Main publication pending Preliminary results pending
Fungicide responses in winter wheat	Stephen Kildea	-determine the response to fungicides at different key timings -evaluation of products	Main publication pending Preliminary results published at National Tillage Conference 2012
Fungicide responses in winter barley	Liz Glynn	determine the response to fungicides at different key timings -evaluation of products	Main publication pending Preliminary results published at National Tillage Conference 2012
Septoria resistance monitoring	Stephen Kildea	-evaluate the changes in septoria populations	Updates published regularly and at the National Tillage Conference (each year)
P and K responses in winter wheat	Mark Plunkett/ David Wall	-evaluate yield responses to P ad K in different soil index	Published in National Tillage Conference 2012, International Conference USA and in popular press
Weed control in Winter wheat	Michael Hennessy Tim O Donovan	-evaluate weed control from different herbicide products	Published in Irish Farmers Journal 2011 and in relevant Crop Reports
Weed control in spring barley	Michael Hennessy Tim O Donovan	-evaluate herbicide rates and timings	Published in Irish Farmers Journal 2012/4 and in relevant Crop Reports
Spring Barley Growth Guide	John Spink, Shane	-evaluate yield formation in spring barley	Published at the National Tillage



<p>Evaluation of winter wheat varieties</p>	<p>Kennedy DAFM cereal testing</p>	<p>-Evaluate varieties (yield standing disease, etc.). One of 6 locations</p>	<p>Conference 2014. PhD and scientific papers pending Part of the annual DAFM recommended list</p>
<p>Evaluation of spring barley varieties</p>	<p>DAFM cereal testing</p>	<p>-Evaluate varieties (yield standing disease, etc.). One of 6 locations</p>	<p>Part of the annual DAFM recommended list</p>

Conclusion

Overall the BETTER farm program achieved its main goals of

- develop farmers capacity to generate income and/or increase efficiency to improve income and effective use of labour
- transfer knowledge to growers effectively at a local level,
 - improve and develop existing methods/practices of crop production
 - to improving the adoption of new technology on farm
- capitalise on the integration of research and advice to ensure a rapid technology transfer can take place
 - provide a two way information flow including rapid identification of research issues and opportunities.

The numbers attending events on the farm and/or being influenced by results from the farms extended not only to local farmers close to each Better farm but also regionally and nationally through the advisory service.

Advisors reported using the information from the BETTER farms regularly with Discussion group formats and also in their daily work. The following are some comments from the BETTER farms towards the end of the program on each farm.

Crowleys

“the program has helped us evaluate our financial costs and trials on our farm has given us fresh agronomy insights”

O’Donoghues

“involvement in the identified areas where we can improve and develop in the coming years”

Williamsons

“the input from Teagasc has shown us an alternative way to structure our farm business to make it more workable and profitable”