Teagasc
Agriculture and Food Development Authority

BETTER farm
crops programme

BETTER Farm Crops Open Day – Cork

One of three Open Days will be held in John Crowley's on Thursday, June 17 at his out farm in Renny, Ballyhooly, Cork. Event from 2.00pm to 5.00pm.

The Teagasc BETTER Farm Crops Programme assists tillage farmers to examine their production systems and implement latest technologies to ensure maximum efficiency is achieved.

Get an insight into the farm
- Financial/technical appraisal of tillage crops
- Machinery operations and replacement policy

View Research Trials
- Teagasc Oak Park trials on crop nutrition, weed and disease control
- Department of Agriculture variety trials

Quiz the experts
- Meet Teagasc advisers, specialists and researchers working with the farmer to increase profitability.

Directions to site:
from Fermoy take Mallow road, pass through Ballyhooly village, farm is on the right, two miles from village.

Other Better Farm Crops Open Days

Tuesday, July 6
Farm of George and Ken Williamson, Ambrosetown, Duncormick, Co. Wexford

Thursday, July 8
Farm of Joe O'Donoghue,
Glassmerry House, Herbertstown, Stamullen, Co. Meath

Events are from 2.00pm - 5.00pm. All are welcome

Teagasc
Agriculture and Food Development Authority

BETTER farm
crops programme

BETTER Farm Crops Open Day – Wexford

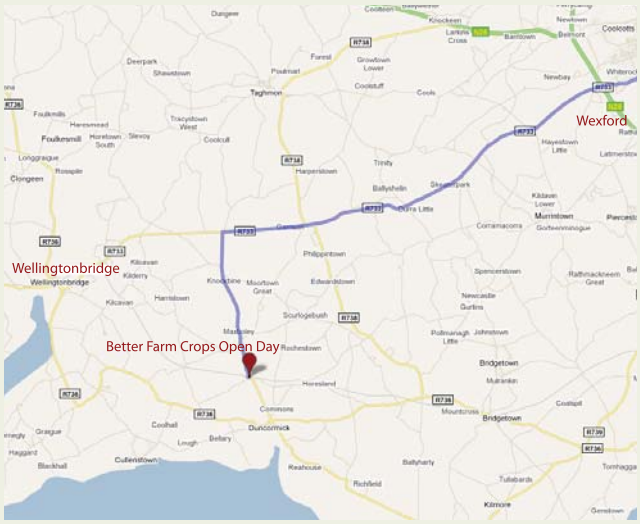
An Open Day will be held on the farm of George and Ken Williamson, Ambrosetown, Duncormick, Wexford on Tuesday, July 6. Event from 2.00pm to 5.00pm.

The Teagasc BETTER Farm Crops Programme assists tillage farmers to examine their production systems and implement latest technologies to ensure maximum efficiency is achieved.

Get an insight into the farm
- Financial/technical appraisal of tillage crops
- Machinery operations and replacement policy

View Research Trials
- Teagasc Oak Park trials on crop nutrition and spring weed control
- Department of Agriculture variety trials

Quiz the experts
- Meet Teagasc advisers, specialists and researchers working with the farmer to increase profitability.



Directions to site:
from Wexford take Duncannon road (R733) for 13 km. Turn left at Aughermon crossroads, then turn ring after for 4.7 km. Site 100 meters under bridge.

Other Better Farm Crops Open Days

Thursday, June 17
Out farm of John Crowley, Renny, Ballyhooly, Co. Cork.

Thursday, July 8
Farm of Joe O'Donoghue,
Glassmerry House, Herbertstown, Stamullen, Co. Meath

Events are from 2.00pm - 5.00pm. All are welcome

Teagasc
Agriculture and Food Development Authority

BETTER farm
crops programme

BETTER Farm Crops Open Day – Meath

One of three Open Days will be held in Joe O'Donoghue's farm, Glassmerry House, Herbertstown, Stamullen, Co. Meath on Thursday, July 8. Event from 2.00pm to 5.00pm.

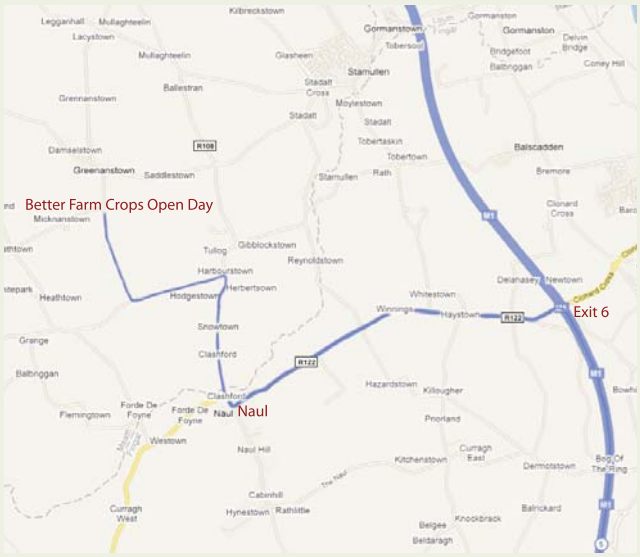
The Teagasc BETTER Farm Crops Programme assists tillage farmers to examine their production systems and implement latest technologies to ensure maximum efficiency is achieved.

Get an insight into the farm
- Financial/technical appraisal of tillage crops
- Machinery operations and replacement policy

View Research Trials
- Teagasc Oak Park trials on crop nutrition and winter wheat weed control
- Department of Agriculture variety trials

Quiz the experts
- Meet Teagasc advisers, specialists and researchers working with the farmer to increase profitability.

Directions to site:
from Dublin take M1 motorway towards Belfast. Exit at Junction 6 for the Naul (R122). Take a right in the Naul village then take the second left. Take the first right and the farm is on your right.



Other Better Farm Crops Open Days

Thursday, June 17
Out farm of John Crowley, Renny, Ballyhooly, Co. Cork.

Tuesday, July 6
Farm of George and Ken Williamson, Ambrosetown, Duncormick, Wexford.

Events are from 2.00pm - 5.00pm. All are welcome

Teagasc
BETTER Farm Tillage Crops Open Days

John Crowley's Farm

Renny, Ballyhooly, Cork

Thursday, 17th June 2010
2.00 p.m. – 5.00 pm

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George & Ken Williamson's Farm
Ambrosetown, Duncormick, Co Wexford

Tuesday 6th July 2010
2.00 p.m. – 5.00 pm

*****

Joe O'Donoghue's Farm
Glassmerry House, Herbertstown,
Stamullen, Co Meath

Thursday, 8th July 2010
2.00 p.m. – 5.00 pm

CONTENTS

Introduction

Crops BETTER Farm Programme

(Business, Environment and Technology through Training Extension and Research)

The Teagasc Crops BETTER farm programme aims 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.

Teagasc advisors, specialists and researchers are working with selected farmers to look at all areas of their production systems and by implementing the latest technologies and research, ensure maximum efficiency is achieved. These farms will become a benchmark for efficient production and for transferring knowledge to other farmers.

The objectives of the programme are; to transfer knowledge to growers effectively at a local level, improve and develop existing methods/practices of production and also improving the adoption of new technology.

This programme will also capitalise on the integration of research and advice where a rapid technology transfer can take place while ensuring a two-way information flow including rapid identification of research issues and opportunities.

The programme focuses on increasing farm output and reducing production costs. Areas of particular interest include; soil management, agronomy, forward planning in areas such as machinery replacement, agro-chemicals, fertiliser, etc. with the intention of increasing margins over input costs, profits, etc.

Cork Crops BETTER Farm

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 operation is key to completing the necessary farm operations in a timely manner.

The farm size is 384 hectares – (336 ha owned and 48 ha rented/leased). Soil type varies with location across the different farms from medium to heavy. Current land use is cereals only.

Breakdown of 2010 land use on Crowley farm

Cropping	Approx area 2010	Av. yields 2006-08
Winter wheat	202 ha	10 t/ha
Winter barley	121 ha	8.6 t/ha
Spring barley	61 ha	7.5 t/ha

The Crowley's holding extends across North Cork within a radius of 50 miles from their base in Mallow. John and Denis are the two main labour units on the farm with some additional help at harvest and planting. Therefore efficiency of operation is key to completing the necessary farm operations in a timely manner. 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.

Wexford Crops BETTER Farm

The Wexford Crops BETTER farm is run by George and Ken Williamson. This father and son operation, in South Wexford, is 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.

Breakdown of 2010 land use on Williamson's farm

Cropping	Approx area 2010	Av. yields 2006-08
Spring barley	49 ha	7.1 t/ha
Spring wheat	15 ha	7.5 t/ha
Winter cereals	*18 ha*	
Other	*50 ha*	

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. Cropping on the farm ranges from winter wheat and oats to spring barley and oats and maize with some Miscanthus. The Williamsons have an interest in the energy company Wexgen who hope to process the miscanthus into briquettes in the near future.

The main short to medium term challenge for the farm business is to work towards a one man system from the current two man system while maintaining farm income. This reduction in labour availability will have a significant influence on rotation, machinery replacement policy and contracting capability.

Meath Crops BETTER Farm

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 spread across a 30 mile radius from their base in Stamullen, Co Meath.

Breakdown of 2010 land use on the O'Donoghue farm

Cropping (approx 2010)	Approx area 2010	Av. yields 2006-08
Winter wheat	109 ha	9.9 t/ha
Spring barley	125 ha	7.23 t/ha
Other	27 ha	

Access to a stable and affordable land bank has proven a challenge year in year out in this highly competitive tillage area. Fragmentation and distances between farm parcels reduce efficiency, increase costs and interrupt timeliness of operations. These factors are influencing profits and the O'Donoghues are exploring all avenues to minimise this fragmentation including; Share Farming, long term lease and rental of larger parcels.

Despite the challenges the O'Donoghues have maintained a critical size while curtailing machinery spend to acceptable levels. In an effort to increase output all grain is stored and dried before sale to maximise returns. Finally, the next generation of O'Donoghues are entering the farming arena and may contribute to the existing farming business.

Dept of Agriculture, Fisheries and Food

Crop Variety Evaluation

As part of its Statutory obligation under EU Legislation, the DAFF carries out National List Trials on all the major crops grown in Ireland. In addition to its Statutory function, the Department goes a step further and carries out an enhanced programme of Recommended List Trials. These trials provide a comprehensive guide for Irish farmers in choosing the most suitable varieties for growing in Ireland. The Crop Variety Evaluation work provides an independent and important service whereby farmers can be confident that the recommended varieties perform well under a wide range of growing conditions.

Cereal variety trials are carried out in the principal production areas of the country to assess varieties for characteristics of economic benefit to farmers. The trials are carried out on Department managed sites plus a number of farms specially selected with the co-operation of Teagasc.

Recommended varieties are evaluated for a minimum of 3 years and are assessed for yield, quality and agronomic characteristics. The trials are carried out over a wide geographic spread so that differences in climate, soil type, and other factors, are taken into account. Varieties deemed suitable for inclusion on the Recommended Lists are those varieties which have shown superior merit over a number of years in the Department's Variety Evaluation Programme.

Growers should give preference to the varieties listed on the Recommended List unless there is strong evidence that some other variety registered on the National Catalogue of Agricultural Plant Varieties is more suited to their conditions.

Spring Cereal Weed Control

T. O' Donovan, M. Hennessy

Controlling broad leaved weeds is necessary in almost all cereal crops. The timing of the herbicide application has a large influence on the eventual cost of the operation. Applying the herbicide early (GS15) when the weeds are at the 2-4 leaf stage and following good growing conditions will aid herbicide uptake, and this is where reduced rates should be considered. A higher level of management input is needed to successfully reduce herbicide rates. Early (GS 15) weed control can result in savings of up to €37/ha (€15/ac) when compared to a late (GS 33) herbicide application. Late weed control (GS 33 +) needs higher herbicide rates and may reduce yields. Always mix herbicides with alternative modes of action to improve the weed spectrum and prevent a build up of resistant weeds. To prevent drift keep the sprayer boom to a maximum of 50 cm above the crop.

- Apply herbicides to small (2-4 leaf) actively growing weeds.
- Reduced rates are effective but need more management input.
- Delayed weed control increases rates required, can cause yield loss and increases costs.

Winter Cereal Weed Control

T. O' Donovan, M. Hennessy

Controlling broad leaved and grass weeds is essential in winter crops to ensure profitable yields and trouble free harvesting. Our wet climate places increased challenges on the persistence of autumn applied herbicides whilst also favouring the growth of grass-weeds especially annual meadow grass (*Poa annua*). The main aim of autumn applied herbicides is to reduce the germination and competition effect of autumn weeds until crop growth takes off in the spring. Occasionally a follow-on herbicide may be required in the spring where autumn control was not satisfactory on a particular weed (e.g. Sterile Brome) is problematic. Timing of autumn herbicides will depend on the weed challenge and spraying opportunities in the autumn. Reduced (lower than recommended by the manufacturer) rates have been successful in Teagasc trials over a number of years but depended on the weed species and growth stage of the weeds at the time of spraying. Reduced rates give more consistent results in barley than wheat due to crop competition effects.

- Our wet climate increases the challenge on autumn herbicides.
- Selection of herbicides and rates should be field specific.
- Reduced rates are effective but need more management input.
- A spring 'clean-up' may be needed where inadequate autumn weed control was achieved.

Nitrogen for Crops

R. Hackett

Nitrogen is a key nutrient for crop production. However loss of nitrogen from crop systems to the environment can have deleterious effects. Therefore for both economic and environmental reasons applications of N to crops should be optimised.

The economic optimum nitrogen application rate will vary depending on grain price and nitrogen cost. However large changes in the price of grain or fertiliser nitrogen are required to change the economic N rate significantly.

Biological factors, particularly those which affect the supply of nitrogen to the crop from the soil, will also affect the optimum fertiliser N rate. Factors which affect soil N supply include previous cropping history, application of organic materials to previous crops, soil texture and climatic factors. These factors should be taken into account when determining optimum N rates.

Current work aims to achieve a better understanding of the supply of N from the soil. It also aims to examine the effect of fertiliser N timing on N use efficiency by the wheat crop

- Economic N rate determined by economic and biological factors
- Large changes in grain or N price required to change economic optimum significantly

The Value of Soil Testing

M. Plunkett

Soil analysis is a very small farm expense costing as little as €1.80/ha/yr and will be valid for 4 - 5 years. National soil test results indicate that approximately 50% of soils are index 1 and 2 and 50% are index 3 and 4.

Soil testing provides vital information on the soils fertility status and will be the basis to optimising nutrient applications to maximise return from crop inputs.

Correct soil lime status is the starting point in ensuring optimum nutrient availability. Fertilizer efficiency will be reduced where the soil pH is below the optimum, aim to maintain a soil pH 6.5 for cereal production.

With current crop margins there is the temptation to reduce production costs. This can be done by reducing or omitting P and K fertiliser applications. On index 4 soils omit P and K fertilisers and there is scope to reduce on index 3 soils but caution needs to be exercised on low fertility soils – index 1 and 2. On these soils the reserves of soil P and K will be lower thus resulting in a lower grain yield potential. Research would indicate that where there is insufficient soil P and K applied fertiliser N will not be used as efficiently by the crop resulting in a loss in grain yield and a financial cost to the grower.

Test soils regularly to maximise the return on fertiliser investment and for 2010 have your continuous tillage soils tested for soil organic matter to meet cross compliance requirements.

Barley Disease Control

J. Spink

Crops differ in which are the most important stages in their life cycle for yield formation, and therefore when they will respond most to disease control.

Yield response to fungicides in wheat is mainly through protecting the top 3 leaves to maximise grain filling. Recent research indicates that barley is different and high grain number is critical for yield. Fungicide use in barley, therefore, needs to be timed to ensure that ear number and grain number per ear are not restricted. Preliminary work in the UK indicates that early disease, particularly Rhynchosporium, can reduce head numbers and reduce the number of grains per head. This means that the timing of disease control (and proportion of spend on fungicides) in barley may need to be targeted at earlier stages than in wheat.

There is ongoing work at Oak Park and on the BETTER farms testing the response to a wide range of spray timings on both winter and spring barley. Sprays are being applied from the 2 leaf stage (Autumn in winter barley) through to late heading sprays.

- High ear and grain numbers are critical for high yield in barley
- Early disease in barley reduces head and grain number
- Barley fungicides must protect ear and grain numbers so early control may be necessary.

Fungicide Resistance in Septoria

E. O' Sullivan, S. Kildea

Septoria tritici in wheat crops has been resistant to MBC fungicides since the 1980's and to strobilurin fungicides since 2003. Resistance to MBC and strobilurin fungicides is genetically stable and does not carry a fitness penalty. Oak Park studies showed a shift in the sensitivity of Septoria to the triazole fungicides Folicur and Caramba between 2004 and 2005. Subsequent field plot trials showed that full or reduced rates of these fungicides rapidly selected for these insensitive strains. Sensitivity to the two most commonly-used triazoles Opus and Proline remained stable between 2003 and 2008 and both products gave effective Septoria control. In late 2008 and early 2009 isolates of Septoria collected from some crops showed reduced sensitivity to Opus and Proline in laboratory tests. The degree of insensitivity was greater for Proline than for Opus. Most of these isolates are sensitive to Folicur and Caramba. Initial results indicate that the field performance of epoxiconazole and prothioconazole appears to have been affected to some extent. It is important that triazoles are mixed with or alternated with a fungicide with different modes of action to minimise the potential for further shifts in sensitivity.

Septoria in wheat:

Resistant to MBC

Resistant to strobilurins

Folicur and Caramba – shift in sensitivity 2004-2005

Opus and Proline – shift in sensitivity 2008-2009

Beware of creating conditions for further shifts in sensitivity

The Septoria Timer

E. O'Sullivan, S. Kildea

The practice of spraying crops on a routine basis determined by critical crop development stages is an insurance approach. This strategy takes little account of infection levels, weather conditions or varietal resistance. However, in certain years of low disease pressure, trial results showed that reduced numbers of sprays or reduced rates of fungicides controlled disease and maintained yield potential as effectively as full rates. However, it is impossible to predict the seasons when growers could benefit from reducing fungicide inputs. One method of obtaining more precise information that could give growers the confidence to reduce spray inputs is the use of a Decision Support System (DSS). Most DSS's are PC or internet based but a simpler approach is the use of an in-crop instrument, the Theis Septoria Timer. The device consists of two parts, a sensor which measures the duration of leaf wetness and a data logger. The instrument records the occurrence of weather patterns conducive to the development and spread of septoria and thus indicates the need for and timing of fungicide applications.

The septoria timer:

An in-crop instrument

Records and logs weather data

Indicates if and when spraying is necessary

Machinery Costs

D. Forristal

Machinery costs can account for about 40% of crop production costs when depreciation, interest, repairs, fuel and labour costs are considered. Our relatively small-scale production, field sizes and distances between land blocks, coupled with a challenging climate can make it difficult to achieve competitive machinery costs. There is a huge range in machinery costs on tillage farms. All tillage farms must strive to carry out quality, labour-efficient and timely machinery operations, appropriate to their soils and cropping system, at the lowest possible cost. Machinery costs on the BETTER farms are being analysed using the Oak Park machinery cost programme. An initial analysis of the individual farms machinery policy is now presented and future mechanisation policy changes will be considered as the project progresses. Key factors to consider include.

- Mechanisation planning is critical – growers need to plan for the future. Accurate costing is essential.

- Where economies of scale advantages exist, they should be considered even if this means hiring a contractor or entering share farming or machinery partnerships to achieve it

- Machinery ownership policies (size, replacement policy etc) must match the individual farms needs.

Sprayer Maintenance and Calibration

J Maloney, S Goodwin

A tillage farmer will spend on average €250 per hectare on crop protection products in a season accounting for approximately 25% of the variable costs in winter wheat production (Teagasc Crop Cost and Returns, 2010).

Spray operators should ensure the sprayer is at peak efficiency to get the best value for money from the pesticides used.

The following areas are key to effective and safe pesticide application.

Boom stability and correct height (e.g. 50-70 cm)
Pump maintenance and performance (e.g. 280 l/min for a 24m sprayer)
Hoses, clips and attachments secured
Pressure and suction filters are clean and intact
Pressure clock is accurate
Nozzles replaced if worn (above 10% variation in output)
Flow controller will not detect nozzle wear
Always calibrate the sprayer at the beginning of each season or where application variation is suspected or where the following has been changed; nozzles, operating pressure, tractor or tractor wheels
Tractor forward speed calibration
General maintenance - greasing, washing down, antifreeze for winter storage and machine condition
Always follow health and safety guidelines

Make Maintenance a Priority

Preserving Grain On Livestock Farms

S. Kavanagh

Factors that need to be considered when looking at preserving grain on-farm:

1. Capital investment – What capital investment is needed in storage facilities? Could existing facilities be altered?
2. Moisture content of the grain – Moisture content is the single biggest factor that will dictate preservation option and storage facility needed.
3. Harvesting – The window for harvesting grain for some storage options is short. Do I have access to harvesting and processing equipment, as required?
4. Treatment costs – All costs should be considered including additive, processing, storage losses, working capital and ensiling costs.
5. Risk analysis – What are the likely risks associated with on-farm storage? What are the likely storage losses associated with different treatment options.
6. Handling costs – Investment in additional equipment such as a diet feeder or a loader etc can make many storage options unviable, unless there is a significant scale of operation involved.
7. Flexibility – Some treatment options allow more flexibility in terms of selling grain subsequently, if there is a price rise.
8. Labour – Labour is a scarce commodity on many farms. Is there a significant labour input required?
9. Management skills – Do I have access to expertise to ensure that the grain is harvested and stored in ideal conditions? If home mixing, do I have the management skills to watch the feed ingredients market and buy ingredients competitively.
10. Legislation – Will the feed storage and home mixing units meet the DAFF requirements for Feed Hygiene?

Safety and Health for Tillage Farmers

J. McNamara

Managing Safety and Health on all farms is crucial to prevent Injury and occupational Ill Health, cause pain and suffering and can impact negatively on a farmer's lifestyle and capacity to effectively operate a farm. In 2010, 11 farm deaths have taken place to 31st May (provisional figure) which is the same level as for all of 2009.

A Code of Practice for Preventing Injury and Occupational Ill Health in Agriculture has been introduced under the Safety, Health and Welfare at Work Act (2005). The Code includes a Risk Assessment Document which can be completed as an alternative to preparing a written Safety Statement for farms with three or less employees. Completing this document and acting on it is the best approach to manage Safety and Health. Teagasc provides short half-day training courses on complying with safety and health legislation.

Research conducted by Teagasc on Safety and Health shows that:

- Tillage farms have twice the level of injuries compared to all farm systems.
- Just 47% of tillage farms have completed a Risk Assessment/Safety Statement to-date.
- Farmers have a high level of physical injuries with 56% reporting a bone, joint or muscle problem in the previous year and 38% reporting back pain
- 36% of farmers do not wear protective clothing when handling/pouring chemicals.

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