Crops
Environment
& Land Use
Programme

National Tillage Conference 2015

teagasc
Agriculture and Food Development Authority

Programme

09.30 Registration & Tea/Coffee

10.30 **Conference Opening**
Frank O'Mara, Director of Research, Teagasc

Session 1

10.45 **CAP Reform and Greening**
Paud Evans, Department of Agriculture, Food & the Marine

11.15 **A practical approach to greening requirements**
Ivan Whitten, Teagasc and Tim Ronaldson, Farmer, Kildare

11.45 **The role of cover crops in cereal production in Ireland**
Richie Hackett, Teagasc

12.15 Panel discussion and Q&A

13.00 Lunch

Session 2

14.30 **Cereal disease control for 2015**
Steven Kildea, Teagasc

15.00 **Break crop agronomy and the Teagasc/IFA grain levy break crop research programme**
John Carroll, Teagasc

15.30 **The spring barley guide**
John Spink and Ciaran Hickey, Teagasc

16.00 **Close of Conference**
Professor Gerry Boyle, Teagasc Director

16.15 Tea/Coffee

NATIONAL TILLAGE CONFERENCE 2015

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Crops Environment and Land Use Programme

Oak Park Crops Research

Carlow

Thursday, 29th January 2015

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Programme

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Contents

CAP Reform and Greening

Paud Evans
Department of Agriculture, Food and the Marine

SUMMARY

The Single Payment Scheme, which was implemented in Ireland in 2005 ended on 31 December 2014 and is replaced by The Basic Payment Scheme (BPS) and the Greening Payment. This is part of the new measures agreed in the reform of the Common Agricultural Policy. As direct payments from 2015 will take the form of four distinct schemes, the payment that a farmer receives under the new Direct Payment system is no longer a 'single payment' but will be a combination of payment under four separate schemes, which are as follows.

- Basic Payment Scheme.
- Payment for Agricultural Practices beneficial for the Climate and the Environment – this will be known as the Greening Payment.
- Young Farmers Top-Up.
- Aid for the production of Protein Crops.

All eligible farmers will receive the Basic Payment Scheme and Greening while some farmers may also qualify for a further payment under the Young Farmers Scheme or under the Coupled Support for Protein Crop Scheme.

A very significant percentage of the national ceiling (30%) is allocated to Greening each year and all farmers who participate in the Basic Payment Scheme must also implement the Greening provisions. However well over 90% of applicants will automatically qualify got the greening payment on the basis of their current farming practices. The remainder, which are arable farmers, will have to undertake specific measures to qualify for the greening payment. In summary, there are two main requirements, which are Crop Diversification and Ecological Focus Areas (EFA). While many arable farmers in Ireland already satisfy the two or three crop rule under Crop Diversification and the 5% required under EFA, all arable farmers will be required to provide all of the required information in their applications. The actions of those farmers, who have to alter their existing farming practices to ensure compliance will have some knock consequences for the arable crop sector in Ireland. This year will also see the introduction of a coupled aid for the production of protein crops in Ireland, which could amount to €250 per hectare depending on the take-up.

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TEAGASC NATIONAL TILLAGE CONFERENCE

29 January 2015

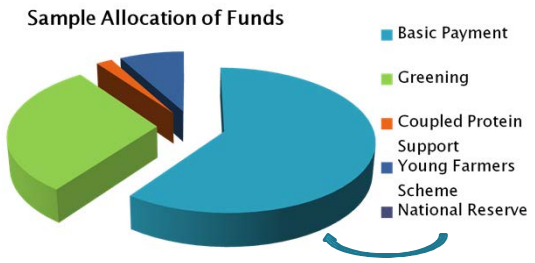
Greening and CAP Implications

Summary of 2015 Schemes

Single Payment Scheme replaced by Basic Payment Scheme

- Young Farmers Scheme
- Greening
- Coupled Support for Protein Crops
- National Reserve
  Priority access: Young farmers and new entrants

Potential Payments



Reference Points

- receive a direct payment in 2013 (single payment scheme, grassland sheep scheme, Burren Life, or Beef Data Programme) → 2013 Allocation Right
- Eligible land declared in 2013 → *2013 Land Reference
- Value of Entitlements owned in 2014 (including entitlements leased out) plus value of 2014 Grassland Sheep Scheme → 2014 Value Reference (a fixed % of this value will be carried forward)
- Eligible land declared in 2015 → *2015 Land Reference
- *The number of entitlements is established by using the lesser of the eligible hectares declared in 2013 or 2015

Sample Calculation

2014 Value
€9000 SPS+€1000 GLS

→ **Value of Entitlements** = €10,000 X 65% = €6500

2013 Land Reference
100

2015 Land Reference
80

Lesser → **Number of Entitlements** = 80

Initial Unit Value is established by dividing the value by the number of entitlements= €81.25

Convergence of Entitlements

- High Initial Unit Value
- National Average *€171.82
- 90% National Average *€154.64
- Minimum Value of 60% *€103.09
  - (by 2019)

(Transfer of €103m)

- Low Initial Unit Value

*estimated values based on 2013 data

Greening Measures

- Crop Diversification
- Permanent grassland
- Ecological focus area (EFA)

Commission proposals V Measures Adopted

Exemptions

Measures	Proposals	Adopted Measure
Crop Diversification	> 3 ha =3crops	>10 ha< 30 ha = 2 crops >30ha = 3 crops
Ecological Focus Areas	7% of arable lands Protein crops, catch crops not included. No weightings	5% with protein and catch crops and weightings.
Permanent Grassland	5 % ratio at farmer level including re-seeding	5% at National level with no ban on ploughing.

Crop Diversification cont.

Some examples

1

Spring Barley
Temporary Grassland
Fallow land

2

Spring Barley
Winter Barley
Fallow land

Crop Diversification cont.

Temporary Grassland – explained

- In 2015, a land parcel would be temporary grassland if it satisfied the following conditions.

2010	2011	2012	2013	2014	2015
Arable crop	Arable crop or grass	Arable crop or grass	Arable crop or grass	Arable crop or grass	Grass = Temporary grassland

Crop Diversification cont.

- Main Crop – not more than 75% – this applies to both 2 and 3 crop requirements
- That means that the second (or a mixture of crops) must be greater than 5%
- Two main crops – not more than 95%
- That means that the third crops (or a mixture of crops) must be greater than 5%
- Landscape features that form part of the eligible area can be taken into account in the measurement of areas of separate crops – margins and hedges form part of the crop area
- Use of total eligible area (reference area) rather than claimed area

Crop Diversification – GLAS

- There will be a GLAS Scheme in place in 2015.
- Winter cover under GLAS will be equivalent to Crop Diversification.
- There will be priority access for arable farmers with greater than 30 ha.
- On-going discussions on equivalence with EU Commission.
- Issues at stake are (i) area to be sown and (ii) period in ground.

Crop Diversification – Advice Only

- Ensure that you have options when sowing arable crops in Spring.
- Bear in mind that field margins and hedgerows form part of the crop for the purposes of CD measurements – 75%, 95% etc.
- **Be aware of consequences using equivalence under GLAS for Crop Diversification (2015 only).**
- Be cautious about planting areas close to the 75% and 95% thresholds – particularly, if sowing more than one crop in the same LPIS parcel.

Ecological Focus Areas (EFAs)

- Farmers with 15 ha or less of arable land exempt
- Farmers with more than 15ha of arable land must ensure that at least 5% of their arable land is an ecological focus area – known as EFAs
- Arable areas used to establish 5% includes temporary grassland but excludes permanent grassland and the exception of buffer strips and landscape features, which are situated on permanent grassland and are declared as EFAs. Also excludes permanent crops

EFAs cont.

Landscape Features

- Includes hedgerows and drains/ditches
- Hedges and drains already protected in Ireland under Cross Compliance.
- Conversion/weighting factor: 1 meter of hedgerow = 10^2 meters of EFA area
- Half the hedgerow associated with each parcel
- Full hedgerow if arable parcel adjacent to permanent grassland farmed by applicant or along a public road.

EFAs cont.

Nitrogen Fixing Crops

- These are protein crops and include peas, beans, sweet lupins, red clover and alfalfa.
- Each hectare of protein crops is equivalent to 0.7 ha of EFA area.
- Protein crops can benefit from the Coupled Protein Aid (peas, beans and sweet lupins only).

EFAs cont.

Lands Lying Fallow

Identification of arable fallow lands

- Must be arable fallow lands.
- Land must have being sown with crop during one or more of previous years.
- Cannot be part of a parcel, which has not been tilled.
- Land declared as fallow but not cropped since 2009 will not be eligible as fallow in 2015.

EFAs cont.

Lands Lying Fallow

Management

- Lands to remain fallow for the minimum period of 1 January to 31st July.
- Grass seed can be sown during this period.
- A crop cannot be harvested during this period.
- Can be grazed after 31st July.
- Lands must be maintained in good condition.

EFAs cont.

Lands Lying Fallow

Management contd.

- Minimum fallow land area: 0.1 ha.
- Minimum width must be 6 meters.
- Wild bird cover; is eligible fallow land.
- Temporary grassland in year 5 can be declared as fallow in 2015 and remain as fallow if it is declared as it in subsequent years unless the fallow cycle is broken.

EFAs cont.

Catch Crop/Winter Cover

- Can be under sown grass with main crop
- A mixture of seeds – based on listing
- Must be sown by 15 September
- Each hectare of catch crops/winter cover is equivalent to 0.3 hectare of EFA
- The same parcel cannot be used for two EFA measures in the same year – e.g. protein crops followed by catch crops

EFAs cont.

Summary of EFAs

Hedgerows	Have been mapped by Department.
Ditches/drains	Applicants amend where necessary
Buffer Strips	Contributes more than actual area to EFA requirement
Fallow land	area (actual)
Eligible Forestry	area (actual)
Short Rotation Coppice	area (actual)
Protein Crops	area – reduced to 0.7 ha for EFA
Catch crop/winter cover	area – reduced to 0.3 ha for EFA

EFAs Advice

- If in doubt, leave it out
- Aim high in relation to % EFA

EFAs cont.

Future

- As already stated, the Commissioner will review the greening measures with a view to simplifying.
- The Commission has undertaken to review the implementation of EFAs after 2015.
- Commission must present report evaluating the effectiveness of the measure by 31 March 2017.
- Report may be accompanied by proposals.
- Proposals may include an increase of the EFA minimum area from 5% to 7% – must be agreed by Council of Ministers and European Parliament.

Greening Payment

- Payment will amount to an additional 44.27% on to the Basic Payment.
- Arable farmers must apply on-line in 2015.
- Using on-line system will protect farmer.
- On-line system – reflects manual application.
- It would not be possible to process greening applications on paper.
- Would delay the processing of payments to all farmers.

Greening On-line

- Three options open to Department.
- Not provide an on-line EFA Layer.
- Provide layer but not populate hedges, drains and buffer strips.
- Populate with data as was done.
- Underlying system robust.
- Difficult to determine features using electronic means.
- Will be incorrect and will need correction by farmers and advisors/consultants.

Share Farming

- Can apply as a share farming group.
- Must be recognised by Department.
- Must lodge all share farming agreements.
- Agreement must provide for an involvement of share farmers in both inputs and outputs.
- Must declare all of the lands of all share farmers, who wished to be involved in the group.
- Greening requirements applied at group level.
- Eligibility requirements applied at group level.
- Entitlements held separately.
- Payments calculated and paid separately to group members.

Greening deductions

- No greening penalties for non-compliance will apply for 2015 and 2016.
- Penalties will apply on a phased basis from 2017.

- Non-compliance will be dealt with by deduction in the greening payment in 2015 and 2016.
- Greening payment on permanent grassland not affected.
- Basic Payment Entitlements will not be impacted.

Basic Payment Scheme: Greening Calculator

From 2015 the Basic Payment Scheme will replace the Single Payment Scheme. Approximately 30% of the payments under the
prepared as an interim tool to help farmers plan towards meeting any requirements they may have under Greening. It is based up
this calculator, its information may be superseded by subsequent EU or DAFM announcements.

About your land areas

Overview

	Area [ha]	Area [% of Total Claim]
Total Agricultural Area	204.65	100%
Of which		
Tillage	196.30	95.92%
Grassland	8.35	4.08%
Other	0.00	0.00%

Based on the information you provided above:

Result

3 Crop: ✓

You are under the **THREE CROP CATEGORY** and currently meet all the requirements

Does my cropping meet the requirements?

Requirement 1:	You must grow at least three different crops	✓
Requirement 2:	Main crop no greater than 75% of relevant arable area	✓
Requirement 3:	Two main crops no greater than 95% of relevant arable area	✓

If I don't meet the requirements what do I need to change?

Number of different crops:	3	You already have at least three different crops
Largest crop area (not grass or forage):	122.88 ha	Your main crop must not exceed 147.23 ha
Largest two crop areas (not grass or forage):	164.75 ha	Your two main crops together must not exceed 186.49 ha

The table below shows the crop information from your SPS 2014 Application. To see the effects of any planned changes, you can edit the areas shown for each crop type and click the

Arable crops

Arable Habitat	Arable Silage	Beans	Beet	Camelina
0	0	0	0	0
Grass Meal	**Hemp**	**Kale**	**Linnet Habitat**	**Linseed**
0	0	0	0	0
Potatoes	**Rye**	**Spring Barley**	**Spring Oats**	**Spring Wheat**
122.88	0	0	0	0
Vegetables	**Wild Bird Cover**	**Winter Barley**	**Winter Oats**	**Winter Oilseed Rape**
0	0	41.87	0	0

Temporary grassland

Grass Year 1	Grass Year 2	Grass Year 3
0	0	0

Permanent grassland

Destocked Area	Alfalfa	Clover	Grass Not Arable
0	0	0	0

Basic Payment Scheme: Greening Calculator

From 2015 the Basic Payment Scheme will replace the Single Payment Scheme. Approximately 30% of the payments under the new scheme are conditional upon fa
may have under Greening. It is based upon information released to date by the EU and DAFM. Whilst every effort has been made to ensure the accuracy of this calc

About your land areas

You can view and edit the land areas for your farm below.

Overview

Hedges EFA	9.41 ha
Drains EFA	0.00 ha
Buffer Strips EFA	0.97 ha
Eligible Usage EFA	0.00 ha
Total EFA	10.38 ha
Total Arable Area	196.30 ha
% EFA	5.29%

Ecological Focus Area (EFA)

What is it?

Farmers whose arable area is less than or equal to 15ha are exempt from this measure. Where a holding includes more than 15ha of arable land, at least 5% of that
to EFA's - a full list of EFA's and the weighting factors is available in the attached guidance document here.

Does it apply to my situation?

Farmers with less than 15ha of arable land are exempt from this measure. Where a farmer has an arable area of greater than 15ha, there is a requirement to have a

Based on the information you provided above:

Result

Obligation: ✓

You currently meet all the requirements

Parcels

Parcel Number	Townland	Parcel Area [ha]	Linear Landscape Features [ha]			
			Hedges	Drains	Buffer Strips	Amended
D31006008	BALLYMACPIERCE	7.18	0	0	0	
D31006019	BALLYMACPIERCE	7.15	0.8793	0	0	
D31006024	BALLYMACPIERCE	6.04	0.4805	0	0	
D31006047	BALLYMACPIERCE	9.56	1.4199	0	0	
D31006048	BALLYMACPIERCE	3.92	0.4545	0	0	
D31006051	BALLYMACPIERCE	2.41	0.4519	0	0	
D31012002	KNOCKBALLYMARTIN	1.34	0.4685	0	0	
D31012060	KNOCKBALLYMARTIN	3	0.4929	0	0	
D31012078	KNOCKBALLYMARTIN	0	0	0	0	
D31012115	KNOCKBALLYMARTIN	1.27	0	0	0	
D33803101	BALLYBEG MIDDLE	27.39	0	0	0	
D33907018	CLOGHEEN	1.59	0.3579	0	0	
D33907019	CLOGHEEN	2.57	0.3102	0	0	
D34004087	BALLYELLIS	21.82	1.8556	0	0	
D34507163	KILCANWAY	4.84	0	0	0	
D34637076	SPAGLEN	4.99	0	0	0	
D34637077	SPAGLEN	4.87	0	0	0	
D34637078	SPAGLEN	3.04	0	0	0	
D34703126	BALLYGRIFFIN	5.88	0	0	0	

Greening Timeline

- **2014**: On-line Mapping Facility to allow EFA (hedge/drain) layer to be reviewed.

2015

- **January**: Issue of EFA maps and booklet to farmers Christmas.
- **Early February** – BPS application with Greening element online system opened.
- **Late February**: Application forms to issue before end February 2015.

Coupled Protein Aid

- Will be paid on Peas, Field Beans and Lupins
- Total ceiling – €3 million
- Would pay €250 per hectare on 12,000 ha
- Treble area sown in 2014
- Protein crops eligible for aid could also contribute towards meeting EFA requirement
- Crops meets Crop Diversification requirement

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Thank You

A practical approach to greening requirements

Ivan Whitten
Teagasc, Kildare

SUMMARY

With 30% of direct payments dependent on meeting the "greening" criteria, it is important that farmers understand and comply with the new rules. This will allow Irish farmers to maintain the diversity and distinctiveness of our unique landscape. The impact of the new regieme must be evaluated at an individual farm level, and appropriate changes implemented.

Land availability and changes in entitlement values 2015 – 2019

The starting point is to calculate how much arable land and grassland you have in 2015. For greening the calculations are based on "reference areas" and not the actual area of crop. These new greening conditions may impact on farmers in other sectors depending on their historical cropping pattern (for example a dairy farmer with whole crop or maize may trigger greening). Knowing the cropping history of land taken as conacre is also essential. Arable land is any field that was classified as arable in any of the years from 2010 to 2014. Land used for arable cropping in 2015 will be classed as arable for the purposes of greening calculations. This land classification can be checked with the Department of Agriculture, Food and the Marine.

The value of each standard tillage entitlement will drop by 13.8% from €333 to €286 over the next five years so cash flow planning will be vital. Google the CAP 2015 direct payments information centre to download the Department of Agriculture Excel calculator to calculate your farm payments under the basic payment scheme (BPS) and greening.

Farmers need to work out the land bank they require in 2015 and calculate the consequences of dropping low-performance rented land on their direct payment. Separate payment dates for the BPS, greening and any protein support elements may make it wise to adjust loan repayment dates to match them.

Greening: Crop diversification and Ecological Focus area (EFA) requirements

If the farm is all under permanent pasture, or if permanent pasture accounts for more than 75% of the area, and less than 30ha of tillage crops are grown, then greening does not apply. Permanent pasture is all grassland that has been six or more years under grass.

Crop diversification requirements on the farm if above 10 hectares: Either two or three crop types may need to be grown depending on the total crop area. Farmers who have close to 75% of their farmed area in grass with 30 hectares or less of arable, can consider renting additional permanent grassland to secure an exemption. Applying and qualifying for GLAS and adopting cover crops may also give scope for a diversification exemption.

EFA rules on farms above 15 hectares: Where EFAs apply, growers must have 5% of their area comprised of landscape features (hedgerows etc) and area-based options such as protein crops, which qualify as EFAs. Individual on-line maps are currently available to validate and amend landscape features such as hedges, dry drains and watercourse buffer strips. These maps need to be checked and edited on-line immediately. To do this growers must register with DAFM, either on-line, or by contacting the Helpdesk at 1890 252118.

On farm approach to greening

Tim Ronaldson
Naas, Kildare

SUMMARY

In 1979, I started farming with my father after a year in Gurteen Agricultural College. The farm was a 120 hectare livestock farm. My first experience of growing grain was a crop of Kleiber spring wheat which yielded 4 tonne per hectare. In 1997, the farm business grew to 200 hectares through renting additional blocks of land. I introduced 70 suckler cows to compliment an expanding tillage enterprise.

In 2007, a decision was taken to specialise in grain production with area increased to 350 hectares and the sucker herd was sold. The farm specialised in growing winter wheat, winter oats, winter barley and spring baley. In 2010, an opportunity arose to contract farm 140 hectares resulting in 100 hectares being dropped from con-acre. The labour requirement during the peak period is managed by hiring in a contractor to plough and using a local farmer to operate a tractor also. Spring rape was also introduced to spread the work load and as a result of the spread of Oat Mosaic Virus.

In 2014, a decision was taken to purchase a Claydon drill after researching this whole area over a number of years to try and reduce labour and diesel bills. We aim to establish all crops using the Claydon drill, however a lot depends on the weather.

Now with the new regulations upon us, we are looking at what changes we have to make to satisfy drawing down our Basic Payment. As it stands, the three crop rule will not affect us due to our diverse cropping programme. The Environmental Focus Areas (EFA), may be a more difficult requirement to meet. Having looked at the greening maps on-line to check the farms landscape features, our predicted EFA percentage initially was 14%, however after editing it was reduced to just 8.6%. As the River Liffey runs through our farm, we have already established 2 metre buffer strips to comply with Nitrates in 2014 and will apply buffer zones according to pesticides labels. These strips will help us to meet EFA requirements as 2 metres qualify for a weighting of 9 square metres. Even with 8%+ EFA, we are planning to grow 16 hectares of beans as additional EFA area and draw down the €250 per hectare protein supplement. We will try avoid fields with a history of rape.

With an eye to the future, I plan to change a 40 hectare block of rented land into a 5 year lease for my son, who is returning home to farm. As he is FETAC level 6 qualified, he can apply to the National Reserve for entitlements plus the Young Farmer Scheme. This adjustment to my Basic Payment Scheme will take the pressure off renting additional land as this new scheme is based on the value of the Single Farm Payment in 2014 with the hectares based on the lower area of either 2013 or 2015. The adjustment is a once-off method of indirectly stacking my entitlements.

The new Green Low Carbon Agri Environmental Scheme (GLAS) would appear attractive and will help compensate us for the drop in our Basic Payment over the next five years. Our tillage farm is already practicing min till and could introduce green cover crops, fallow and wild bird areas into underperforming arable areas, to maximise the €5000 payment.

A practical approach to greening requirements

Ivan Whitten
Crop Advisor, Teagasc, Kildare

Tim Ronaldson
Farmer, Kildare

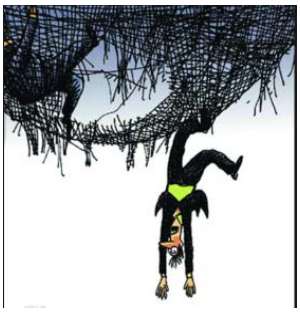
Outline

- Applying the greening rules to farm situations, with different scenarios and possible solutions
- Summary of common tips and errors
- Take home messages

February tasks to avoid payment loss

- Crop Diversification
  - Errors already made !
  - Must comply with 2 or 3 crop rule
- EFA
  - Check all landscape feature maps
    - Physically compare farm to EFA maps
    - Edit hedgerows and open drains on-line
  - On–line only system
  - Concern about awareness

The mixed farmer, who may slip through the net



Permanent grass = 16ha (53.3%)
Winter wheat = 14ha
Total area = 30ha

Solution:

1. Largest crop cannot exceed 75% of arable area = 10.5ha
2. Reseed 6 hectares to temp. grass = 80% (24ha as a % 30ha)

Example 1: 45 hectare mixed farm

31 ha (69%) permanent grassland and 14 ha malt. barley

- **Crop diversification**
  - As only 69% grass
  - 10 – 30 ha crops
  - Farmer must grow 2 crops
- **EFAs**
  - < 15 ha arable
  - No requirement

Solution:

1. Plough 4ha of grass for 2nd crop **or**
2. Apply for Green Low Carbon Agri Scheme (GLAS) – Equivalence **or**
3. Bring grassland area above 75%
   - Reseed 4 ha arable area
     31 ha P. grass+ 4ha T1 grass = 78%
   - Rent additional 12 ha P. grass
     43 ha grass = 75.5%

Example 2: 150 hectare mixed farm

110 ha (73%) perm. grassland with 20 ha maize & 20 ha sp. barley

Crop diversification issues

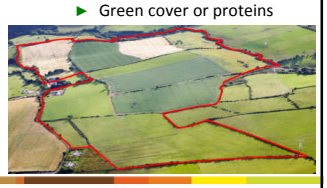
- Only 73% grass
- > 30 ha arable
  - 3 crops required

Solutions

1. Plough 10 ha grass for spring wheat (3rd Crop) **or:**
2. Change 10ha S.Barley to W.Barley (3rd Crop) **or:**
3. Enter GLAS (Green cover Eq) **or:**
4. Reseed 10ha: > 75% grass <30ha arable – no greening

EFA requirement as >15 ha arable

- **Suggestions**
  - Landscape features
    (Hedgerows, drains, buffers)
  - Fallow
  - Green cover or proteins



Example 3: 50 hectare arable farm

48 ha spring barley (malt) & 2.5 ha arable fallow

Crop diversification issues

- > 30 ha arable = 3 crops required

Solutions for 2nd and 3rd crop

- Primary crop maximum < 75% (37ha)
- Combined crop 1 and 2 < 95% (47ha)

1. Introduce a 2nd crop for rotation
2. Claim 2.5 ha fallow as 3rd Crop (and EFA)

   or
3. Apply for GLAS
   - Greening equivalence (25 – 100% of arable area)
   - +/- Minimum tillage

EFA requirement as >15 ha arable

- **Suggestions**
  - Landscape features
  - Fallow
  - Green cover / proteins

Example 4: 114 hectare arable farm

46 ha w. wheat, 34 ha s. barley, 28 ha w. barley & 6 ha temp. grass (yr. 5)

DAFM on-line crop diversification calculator output:

Number of different crops:	4	You already have at least three different crops
Largest crop area (not grass or forage):	46.44 ha	Your main crop must not exceed 85.40 ha
Largest two crop areas (not grass or forage):	80.73 ha	Your two main crops together must not exceed 108.17 ha

Crop diversification not an issue

EFAs requirement = 5.74 ha (5%) **.....planning on 6ha+ but few hedges on farm!!**

- Buffer strips nitrates / spray = 2.5 ha
- Convert all temp grass to fallow = 6.0 ha
  (to maintain arable status on parcel)

Total EFA: 8.5 ha

Useful Tips

Last throw of dice

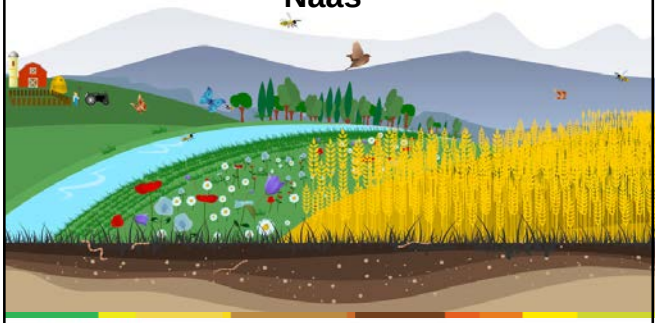
Easy fix for 2nd/3rd Crop + EFA

- Fallow
  - 1ha = 1.0ha EFA
  - min = 0.1 ha
- Green cover
  - 1 ha = 0.3ha EFA
  - Sept 15th to 31st Dec
- Protein crops
  - 1 ha = 0.7ha EFA
  - Protein supplement (€250/ha)

Take Home Messages

- All "arable applications" must be completed on-line
  - View the DAFM on-line calculators and EFA maps
- Greening is a delicate balance
  - Use parcel reference area to calculate crop diversification percentages
  - Get familiar with the EFA definitions and ensure 5% plus on farm
- URGENT action needed: Greening process requires your input

Tim Ronaldson, Stonebrook farm, Naas



Introduction to Stonebrook farm

- Started farming in 1979
  - Educated in Gurteen College
  - 120 hectares grass (Livestock)
- In 1997 farm business expanded
  - 200 hectares tillage (with conacre) & 70 sucklers
- In 2007 decided to specialise
  - Sold livestock
  - Started contract farming 140 hectares
    - Dropped 100 hectares of conacre
  - Total area now 315 ha
  - Challenge to manage labour and machinery usage

Further developments on the farm

Reducing Costs

- Concerned about
  - High establishment costs
  - Costs of labour
- Looked at min-till options
  - Purchased Claydon 3m drill 2014
- Results
  - Plough based costs €190 per ha
  - Claydon system €50 per ha saving
    - 25 litres/ha vs 45 l/ha fuel
    - Less wearing parts
    - Improved timeliness

Claydon drill in action

How I approached Greening

1. Attended Teagasc field events on greening last summer
2. Discussed crop rotation options in early September (with Ivan)
   - Estimated EFA requirement (roughly)
3. Used my DAFM online account to view EFA maps (November)
   - Not very happy with DAFM estimates on landscape features
4. Re-looked at maps in early December
   - Still some errors compared to on-ground features
5. Arranged consultation with Teagasc (Ivan) in December
   - Finalised map adjustments (14.3% ⟶ 8+%)
6. Possible review of EFA 2017 discussed
   - Decision taken to introduce protein crops

How Greening will affect me?

Crop Diversification

- Currently grow 5 crops

But

- We will plant 16 ha of beans
  - Rotation
  - Profitability
  - Increase EFA area
  - Protein payment

My farmed area from Google

How Greening will affect me?
EFA requirements

What do I have?

- Examined on ground landscape features
  - Hedges generally good (7.6% EFA)
  - River Liffey on the farm
    - 2m buffer = 1.25ha (0.7%)
    - 4 fields not EFA mapped

What do I need?

- DAFM estimate was 14%
- Measured on ground **8.6%**
- Adding 16 ha protein 9%
- Total EFA 17.6 %

The Future

- Mark (son) returning to farm
  - Lease 40 ha in 2015 (had in con acre 2014)
  - Apply for National Reserve, Young Farmer & GLAS
  - Opportunity to use pig slurry
    - (60% grant for storage)
- Home Farm
- Looking at GLAS scheme
  - Priority access
    - >30 hectares
    - Min-till
    - Green cover

MULTIFUNCTIONAL LANDSCAPES
BALANCING FARMING & ENVIRONMENT

Thank you for your attention

The role of cover crops in cereal production in Ireland

Richie Hackett
Teagasc, CELUP, Oak Park

SUMMARY

There is renewed interest in the use of cover crops under Irish conditions. Some of the interest is due to regulatory requirements (e.g. green cover requirement and greening requirements) and some is due to a desire to use cover crops to improve crop productivity and/or to maintain soil functionality.

A range of species or mixtures of species can be used as cover crops. Brassica species (e.g. mustard, radish, rape) are commonly used as the seed is relatively inexpensive, easy to broadcast and growth is rapid. Grasses or cereals are also used but in cereal rotations they can lead to carry over of pests and diseases and can themselves lead to volunteer problems in subsequent crops. Phacelia is sometimes used but seed is relatively expensive, however given that it is unrelated to the common crops, it provides a good disease break. Legumes (peas, vetches) have the potential to fix atmospheric nitrogen and hence reduce fertiliser N costs but seed can be expensive.

Cover crops have a range of potential environmental, agronomic and economic benefits. In many areas of the world with similar climate to Ireland reduction of nutrient, particularly nitrate, loss to water is the principal motivation for using covers crops. Irish work has demonstrated that overwinter covers, both of a sown species and natural regeneration, can substantially reduce leaching on light soils. Cover crops can lead to a reduction in the effects of pests, disease and weeds in succeeding crops also. These effects are, however, variable and require careful choice of the species used, given the rotational position. The use of cover crops can increase the content of organic matter in the soil, and in particular the active pools of organic matter which are important for crop production. The effect of non-leguminous cover crops on the fertiliser N requirement of succeeding crops is small and it would be difficult to recommend reduced inputs of fertiliser N where non-legumes are used alone.

While significant yield benefits can be achieved through the use of cover crops, their effect compared to bare fallow or natural regeneration, on cereal yield under Irish conditions is variable; often small and sometimes negative. This concurs with findings in other European countries. Given that sown cover crops incur seed establishment and destruction costs, the use of sown species of cover crops is often not economically justified (in the absence of financial incentives to do so). However management factors such as correct choice of species or species mixture, and good management in terms of sowing date and destruction date can improve the chances of achieving economically beneficial results. Initial experiments with leguminous cover crops suggest that they may have considerable potential to reduce the fertiliser N requirements of crops under Irish conditions.

The role of cover crops in cereal production in Ireland

Richie Hackett
Teagasc CELUP
Oak Park Crops Research

What name

- **Various names used**
  - Cover crops – cover the ground
  - Catch crops – 'catch' nutrients preventing them from being lost
  - Green manures – improve soil characteristics or benefit succeeding crop
- **Any species or mixture of species can be used**
  - selection may be restricted within some schemes
- **Most work at Oak Park (and abroad) on single species**
  - Limited information on benefit of mixtures over single species
  - Legume/non-legume mixtures have been investigated

Options

Grass/cereals

- Risk of pest/disease carryover
- Some can have negative effect on succeeding crop (e.g. rye)
- Risk of weed problems in succeeding crop
- Some possibly less suitable for reduced tillage
- Potential source of forage

Brassicas

- Fast growing and relatively cheap
- Limited disease/pest risk for cereals (if no volunteers)
- Can reduce pests, diseases and weeds
- Can host sclerotinia
- Can be tall – difficult to plough without chopping

Options

Phacelia

- Relatively expensive seed
- Small seed - difficult to broadcast
- Establishment requires cultivation
- Different family to crops – good disease break
- Generally good weed suppression
- Can be easier to incorporate than brassicas

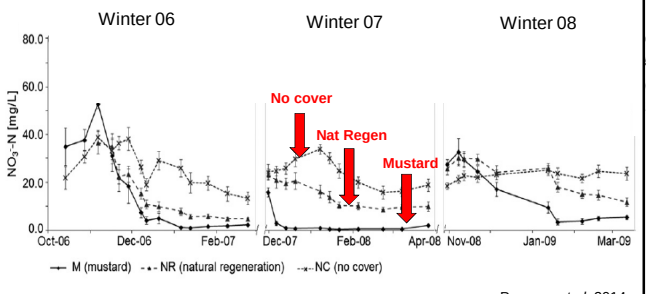
Legumes

- Potential to fix nitrogen and reduce fertiliser requirement
- Seed can be expensive
- Good from disease/pest risk
- Can be poor for N leaching

Potential benefits

- Reduction of nutrient loss (mainly nitrate)
- Reduction of pests, diseases, weeds
- Prevention of erosion
- Improvement of organic matter
- Improvement of soil structure
- Increased nutrient supply to next crop
  - Potential to reduce fertiliser inputs
- (source of forage)
- Yield benefits

Cover crops or natural regeneration can substantially reduce nitrate leaching on leaching prone soils

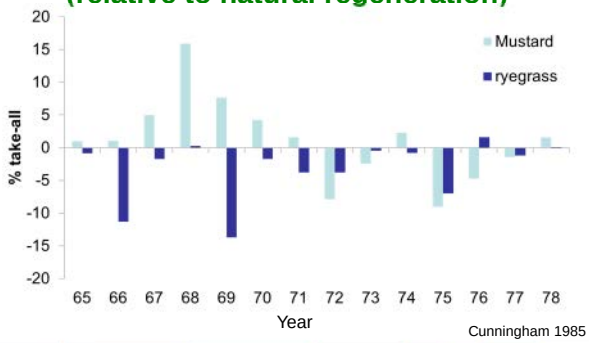


Premrov *et al.* 2014

Effects on pests, disease and weeds

- Can have variable effects
- If cover crop is a host of the disease it can carry disease
  - Rhyncho
  - Mildew
  - Aphids (BYDV)
  - Take-all
- Weed effects generally related to fast growth and height
- Pest/disease reducing effects can be variable
  - Can be variety dependent eg nematode reducing varieties of radish

Take-all in spring barley (relative to natural regeneration)



Cunningham 1985

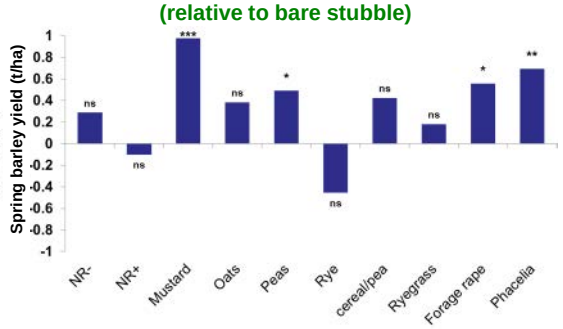
Improvement of organic matter/soil structure

- Effects on total organic matter will be small
  - 3 t/ha DM input ~ 0.01-0.02 % increase in organic matter
- Effects on fractions of organic matter may be greater
  - Can have positive biological effects
- Effects will be governed by inputs
- Reduce effect of rainfall on soil surface
- Improve aggregate stability
- Can affect soil water and temperature

Potential disadvantages

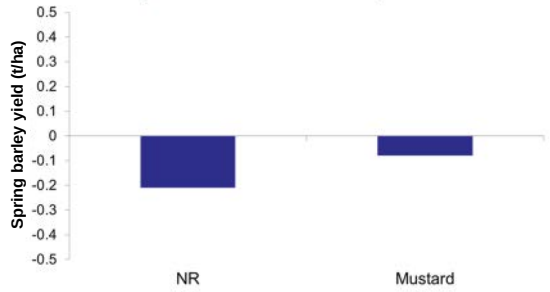
- Negative effects on succeeding crop
  - Allelopathic effect
  - Carryover of pests/disease
- Cost
  - Incurs additional cost in the system
  - Yield benefits are variable and often small
  - Can be a net cost on the system when economic costs outweigh benefits
  - Management can help

Effect on yield Expt. A 2004-2006 Light soil
(relative to bare stubble)

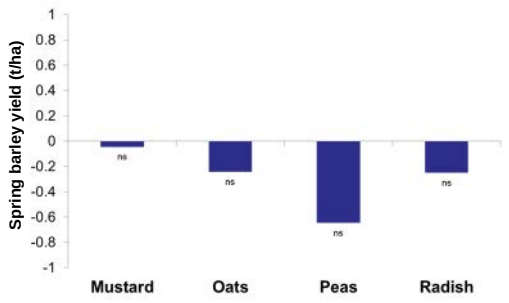


NR - > natural regeneration without stubble cultivation
NR + > natural regeneration with stubble cultivation

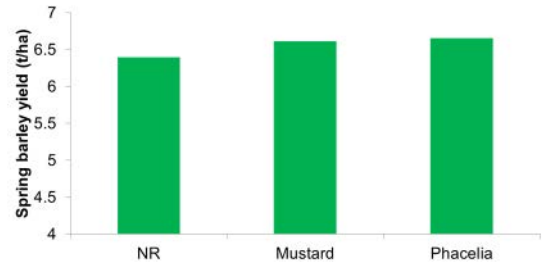
Effect on yield Expt B 2004-2006 Light soil
(relative to bare stubble)



Effect on yield 2004-2006 Medium soil
(relative to bare stubble)

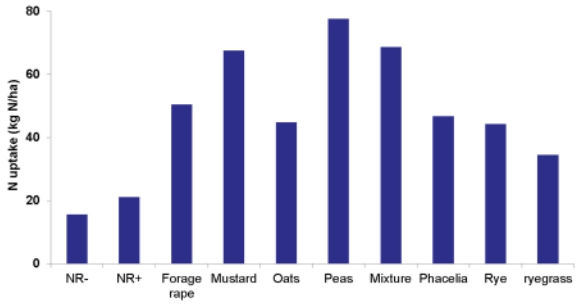


Small effects of sown species compared to NR (2007)



Small effects of sown species compared to NR (2014)

Cover crops can accumulate large amounts of N but accumulation is very variable



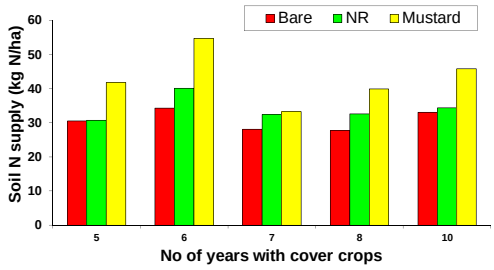
Light soil

Effect of cover crops on fertiliser N requirement

Cover crop N accumulation ≠ **Reduction in fertiliser requirement**

- Many factors involved
- Somewhat comparable to organic manures
- Variable and difficult to predict

Repeated use of cover crops doesn't always lead to increased soil N supply to succeeding crop



Seasonal effect often greater than cumulative effect: note greater growth of cover crop in year 6 (and greater soil N supply above) compared to year 5 in next slides

6th year of cover cropping

5th year of cover cropping

What to sow ?

Factors that need to be considered

- **Seed cost**
  - Cost of expensive seed may not be recouped
- **Rotation**
  - Avoid crops that will cause problem for succeeding crop
- **Method of sowing**
  - Mixtures of big and small seed difficult to broadcast
- **Benefits required**
  - Some crops better for soil structure improvement
  - Some better for positive effect on succeeding crop (e.g. legumes)

(n.b. scheme conditions may dictate what species are allowed)

When to sow?

With spring crop

- Undersown grass/clover – not for grassland establishment

Before harvest

- Spread into growing crop
- Allows early establishment
- Can cause harvesting problems

At harvest

- Autocast type system

Growth declines with temp

Early sowing essential

Late Aug – early Sept

Post harvest

- In combination with normal tillage operation (min-till or stubble cultivation)
- Additional operation if not using autumn cultivation already
- Normally some cultivation + consolidation required

(n.b. scheme conditions may dictate sowing date)

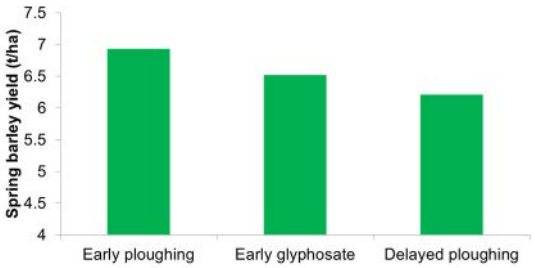
Time of sowing effect

Photos: December 23

Cover growth is dependent on available N

Excessive growth can indicate excessive fertiliser N application to previous crop

Earlier destruction usually gives yield benefit irrespective of cover



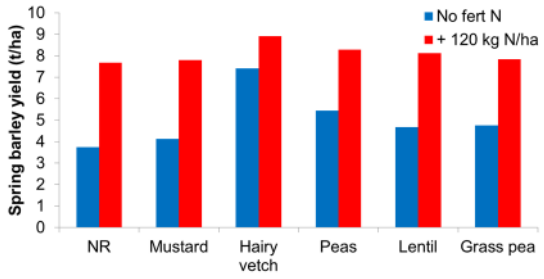
Early ploughing - Feb 13 Delayed ploughing - Mar 30
Early glyphosate - Feb 2 Spring barley sown - April 5
Data are mean of 3 covers (mustard, phacelia, natural regeneration) No effect of cover crop type on time of destruction effect

Legumes

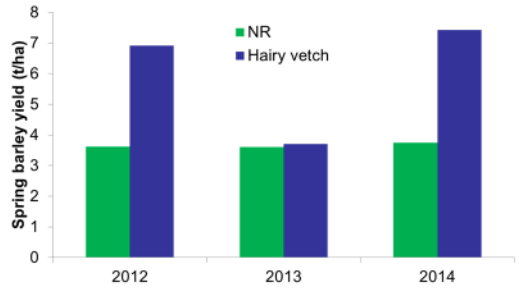
Hairy vetch

Peas

Leguminous cover crops can reduce fertiliser N requirement



Legume N benefit can vary between seasons



No fertiliser N applied
Good growth of vetch in 2012 and 2014, very poor in 2013

Conclusions

Cover crops

- Have positive environmental effects
  - Reduced N leaching (where leaching is a problem)
- Can improve soil structure/soil 'quality'
- Can increase or decrease pests and diseases
- Effects on yield variable
- Effects on N requirement small (exception of legumes)
- Covers invoke additional costs (seed, sowing, destruction)
- Economic benefits can be small in the absence of financial incentive
  - dependent on management, crop choice and year

Cereal disease control for 2015

Steven Kildea and Liz Glynn
Teagasc, CELUP, Oak Park

SUMMARY

High rainfall and warm temepratures in 2014 led to high disease pressure in most cereal crops, with septoria tritici blotch in wheat and Rhynchosporium and net blotch in barley prevalent early in the season. More favourable weather conditions, including periods of good sunshine occurred from early June through until early August providing ideal conditions for grain filling and consequently very low levels of ear blight were reported. An extensive fungicide sensitivity monitoring programme was conducted in 2014. Similar to previous seasons the sensitivity of the Irish *Septoria* population to the azole fungicides epoxiconazole and tebuconazole, and the SDHI isopyrazam were determined. The proportion of the population exhibiting reduced sensitivity to the azoles continues to increase. No dramatic changes in the sensitivity of the population to the SDHIs indicative of resistance have been observed. The efficacy of the main fungicides in both disease control and yield response in the wheat dose response trial conducted at the Knockbeg farm reflects these changes in sensitivity. This was particularly apparent for the azole mixes which showed a reduction in efficacy compared to the excellent control previously attained. SDHIs still continue to provide excellent control, with the benefit of adding an additional mode of action (azole or chlorothalonil) apparent in the yield response. Analysis of 12 T0 comparision trials conducted during the 2012-2014 seasons confimed there was no significant yield benefits from the inclusion of a T0 (irrespective of fungicide) in a well timed programme, even when a relatively weak T1 was applied.

The presence of the G143A mutation in the Irish *Rhynchosporium commune* population was confirmed using molecular techniques. This mutation which confers high levels of resistance to the QoI fungicides in other plant pathogens was detected in one sample in 2013 and in four samples in 2014. The frequency of the mutation in these samples were low (2-18%). The effect of the mutation on sensitivity to the QoIs could not be determined as no viable isolates were obtained from the samples. Extensive monitoring for this mutation will continue in 2015. Further analysis of the net blotch collection established in 2013 for the mutation F129L confirmed the majority of samples had zero or low levels of the mutation present. Four samples however, had >95% frequency of the mutation.

The importance of early disease control in spring barley was highlighted following comparisons of the main fungicide timings in spring barley over six trials during the 2012-2014 seasons. These confirmed the optimum timing for spring barley to maximise yield potential were mid-late tillering and during booting. Given the presence of mutations which can confer QoI resistance in Irish *R. commune* and net blotch populations and the potential for resistance to emerge to the main azoles and SDHI it is essential to ensure that when these fungicides are applied they are mixed with an equally effective partner.

Cereal disease control for 2015

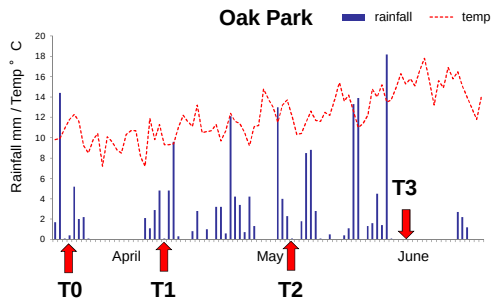
Steven Kildea and Liz Glynn
Teagasc CELUP
Oak Park Crops Research

Presentation outline

- Review of 2014 disease control
- Update on sensitivity
- Fungicide performance
- Guidelines for 2015

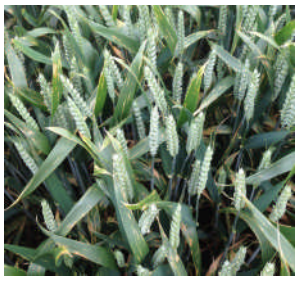
The Irish Agriculture and Food Development Authority

Ideal conditions for disease



The Irish Agriculture and Food Development Authority

High disease pressure



11th June Oak Park

16th June Kildalton

Cereal fungicide resistance

Wheat	Fungicide	Barley
Septoria – widespread	**Azoles**	*Rhynchosporium* (chemical specific)
Septoria – strains detected in continental Europe	**SDHIs**	Net Blotch – strains detected in continental Europe
Septoria – widespread	**QoIs**	Net Blotch – localised *Rhynchosporium* – localised *Ramularia* - widespread
No resistance	**Multsites**	No resistance

Pathogen sampling

2014 Monitoring

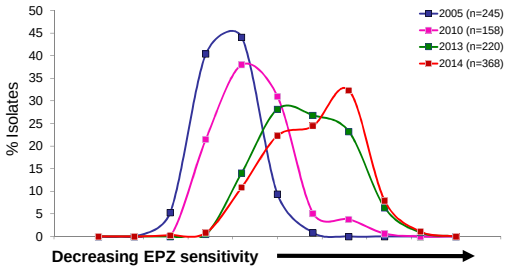
- 30 wheat crops
- 42 barley crops

- Septoria on wheat (Blue)
- Rhynchosporium (Green)
- Net blotch (Red)

- Sensitivity to azoles
- Sensitivity to SDHIs (IZM)
- QoIs (bulk analysis)

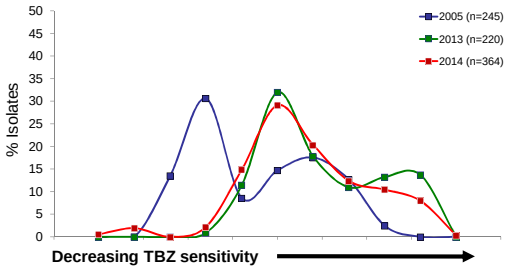
Septoria sensitivity: Azoles

Epoxiconazole

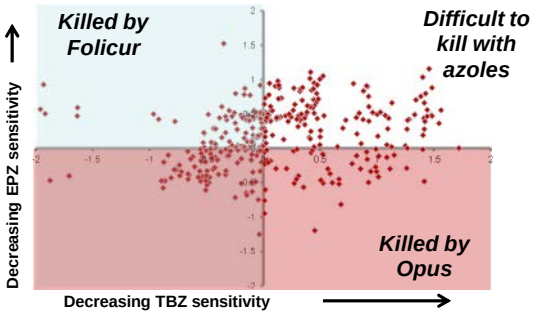


Septoria sensitivity: Azoles

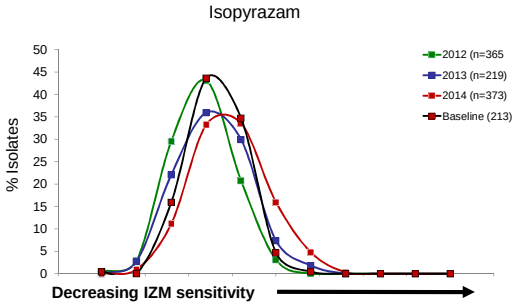
Tebuconazole



Septoria sensitivity: Azoles



Septoria sensitivity: SDHIs



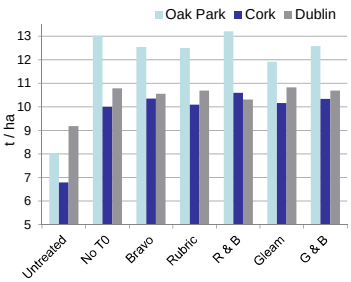
Wheat 2014

- T0 Comparisons
  - Applied GS30 as part of programme
  - No T0 *v* Azoles *v* Bravo *v* Azole & Bravo
  - Three sites since 2012
- Dose Response: ¼ - 2 x recommended rate at Knockbeg
  - Applied GS37 (21st May)
  - Straight azoles, azole mix & SDHI/azole
  - Assessed 4 weeks later – protection
- T3 Trials: Azoles +/- Bravo
  - 3 sites
  - Low disease pressure year

No difference between T3 treatments in 2014

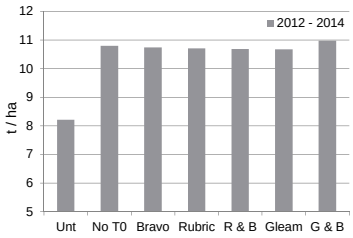
T0: Comparisons 2014

Oak Park	Cork	Dublin
Dunmore	Cordiale	Einstein
T1: Proline 1.0L & Bravo 1.0L		
T2: Adexar 1.6L & Bravo 1.0L		
T3: Prosaro 1.2L		



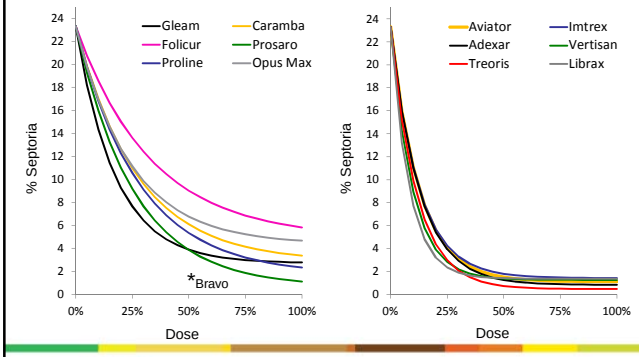
T0: Comparisons 2012-2014

12 Sites
Range of varieties
T1: Proline 1.0L & Bravo 1.0L
T2: Adexar 1.6L & Bravo 1.0L
T3: Prosaro 1.2L (Gleam 2.0L 2012)

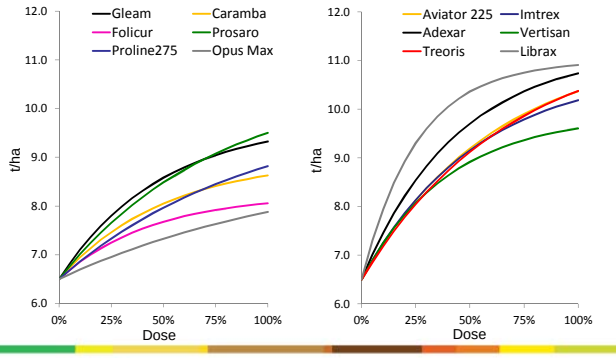


No significant yield benefit from T0's

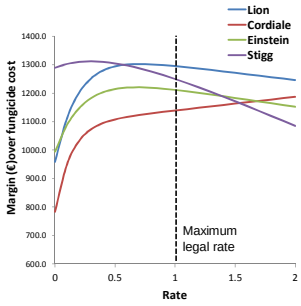
Product comparison 2014: Disease



Product comparison 2014: Yield



Variety choice: First line of defence



Variety	Resistance	Optimum Rate
Cordiale	4	2.0
Einstein	4	0.7
Lion	7	0.7
Stigg	8	0.3

Aviator Xpro applied at T1 & t2

Conclusions: Wheat

- Continued erosion of sensitivity to azoles
- Performance of azole mixtures now affected
- No SDHI resistance detected
- SDHI / azole mixtures still provide best efficacy
- No significant benefit of T0s to yield

Wheat 2015

Winter	T0	T1	T2	T3
Diseases	• Septoria • (Rust)	• Septoria • Stem Diseases • Rust	• Septoria • Rust	• Fusarium • Septoria

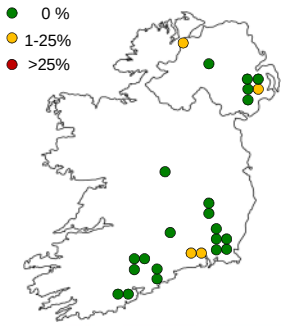
Wheat 2015

Winter	T0	T1	T2	T3
Diseases	• Septoria • (Rust)	• Septoria • Stem Diseases • Rust	• Septoria • Rust	• Fusarium • Septoria
Low Disease Pressure	------	Azole (Mix) & Multisite	SDHI / Azole & Multisite	Azole (mix) +/- Multisite

Wheat 2015

Winter	T0	T1	T2	T3
Diseases	• Septoria • (Rust)	• Septoria • Stem Diseases • Rust	• Septoria • Rust	• Fusarium • Septoria
Low Disease Pressure	------	Azole (Mix) & Multisite	SDHI / Azole & Multisite	Azole (mix) +/- Multisite
High Disease Pressure	Multisite & (Strob)	SDHI / Azole & Multisite	SDHI / Azole & Multisite	Azole (mix) +/- Multisite

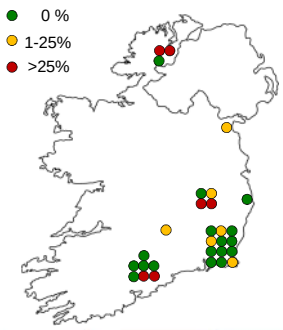
Rhynchosporium sensitivity: QoI



- QoI / strobilurin resistance detected in 2013 (1 sample) and 2014 (4 samples)
- Detection based on G143A mutation
- Frequency in samples 2 – 17%
- All samples collected prior to fungicide treatment
- To date unable to retrieve viable isolates from samples

Always mix QoIs with additional MOA

Net blotch: QoI (F129L)



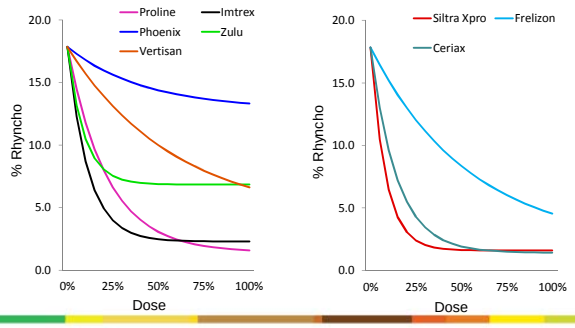
- Further analysis of 2013 collection
  - Spring barley crops 2013
  - Winter barley 2014
  - Volunteers from 2013 crops
- 28 sites examined in detail
- Detection based on F129L mutation
- Frequency in samples 1 – 98%
- 4 samples > 95% F129L

Always mix QoIs with additional MOA

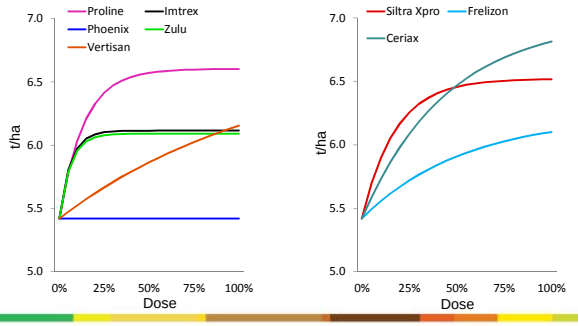
Barley 2014

- Dose Response: ¼ - 2x recommended rate at Cahir
  - Applied GS31 (8th April)
  - Straight triazoles, triazole mix & SDHI/triazole
  - Assessed 5 weeks later – protection
- Spray Timings
  - Trials 2012-2014
  - <GS30, GS31/32, GS39-49, GS59

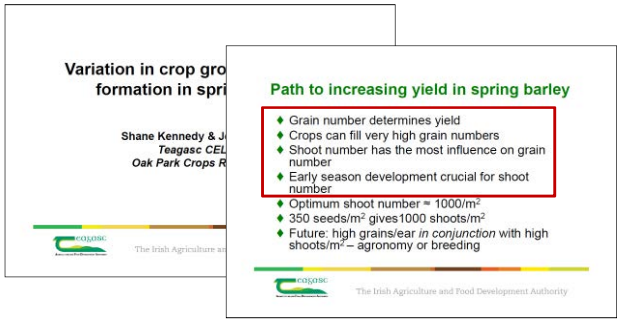
Product comparison 2014: Disease



Product comparison 2014: Yield



Spring barley – when to spray?



Spring barley – when to spray?

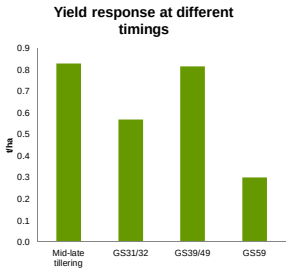
Spring Barley Fungicide Programmes	
Targets:	Rhynhcosporium, Net blotch, Mildew, etc
Timings	tillering, stem extension, booting, ear emergence

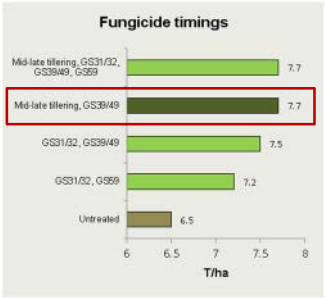
Determing optimum timing

- 2012-2014
- 6 sites (Oak Park, Wexford, Kildalton)
- All combinations of timing assessed
- Siltra Xpro (1.0l/ha)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<GS30	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-
GS31/32	X	X	X	X	-	-	-	-	X	X	X	X	-	-	-	-
GS39/49	X	X	-	-	X	X	-	-	X	X	-	-	X	X	-	-
GS59	X	-	X	-	X	-	X	-	X	-	-	-	X	-	X	-

Spring barley – when to spray?





Conclusions: Barley

- Range of actives available for barley disease control
- Ensuring early disease control essential
- Localised resistance to the QoI fungicide in net blotch and *Rhynhcosporium* – impact on control??
- Mix different effective MOA for disease control and anti-resistance management

Barley 2014

Winter	T1 (GS 25-30)	T2 (GS 32-37)	T3 (GS 39-49)
Diseases	• Rhynchosporium • Net Blotch • (Mildew) • (Rust)	• Rhynchosporium • Net Blotch • (Mildew) • (Rust)	• Rhynchosporium • Net Blotch • Ramularia • (Mildew) • (Rust)

Barley 2014

Winter	T1 (GS 25-30)	T2 (GS 32-37)	T3 (GS 39-49)
Diseases	• Rhynchosporium • Net Blotch • (Mildew) • (Rust)	• Rhynchosporium • Net Blotch • (Mildew) • (Rust)	• Rhynchosporium • Net Blotch • Ramularia • (Mildew) • (Rust)
Programme	Mixtures SDHI/azole/QoI/multisite Mildewicide where required	Mixtures SDHI/azole/QoI/multisite Mildewicide where required	Mixtures SDHI/azole/QoI/multisite Mildewicide where required

Barley 2014

Spring	T1 (GS <30)		T2 (GS 37-49)
Diseases	• Rhynchosporium • Net Blotch • (Mildew) • (Rust)		• Rhynchosporium • Net Blotch • Ramularia • (Mildew) • (Rust)
Programme	Mixtures SDHI/azole/QoI/multisite Mildewicide where required		Mixtures SDHI/azole/QoI/multisite Mildewicide where required

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Break crop agronomy: The Teagasc/IFA grain levy break crop research programme

John Carroll, Dermot Forristal and Faisal Zahoor
Teagasc, CELUP, Oak Park

SUMMARY

With just 9.6% of the current arable area under a break crop, there is an urgent need for suitable break crops to address crop rotation issues. This presentation describes the recently commenced Teagasc/IFA research programme dealing with break crops, focusing particularly on bean agronomy. It also indicates our future research direction in break crop agronomy.

As crop production has become more specialised, rotation has declined, as grass has disappeared from most tillage farms for 20 to 40 years now. Non-cereal break crop options are quite limited and while soil organic matters are still reasonable, lack of rotation impacts negatively on cereal yields and production costs. The 2012 Tillage Sector Development Plan produced by the Teagasc crop stakeholders recognised this need for break crops and also for the protein deficit to be addressed. In response, Teagasc Oak Park have initiated several research projects addressing this deficit including: a DAFM-RSF desk study evaluating crop options (CROPQUEST); an oats programme and a grain levy supported break crop agronomy programme.

Break crop benefits in terms of disease/weed control, soil structure, nutrients, environmental factors and of course yield have been widely documented and are the subject of a literature review through the CropQuest project.

The Teagasc/IFA break crop programme currently focuses on oilseed rape establishment and disease control and beans. Beans research including topics such as varieties (winter), seed rates & sowing dates, early N application, disease and flowering control is currently in progress. First year results need to be supplemented with research over a number of years to produce valuable agronomic and physiological data. Future research plans include genetic/varietal development (under VICCI DAFM-RSF funded project), establishment and early growth, and physiological (ideal plant stand, crop canopy etc.) components, which will contribute to a comprehensive programme capable of delivering valuable results.

A sugar beet yield trial comparing new varieties also commenced in 2014. Early indications show a narrowing of the gap between fodder and sugar beet yields, but a number of years data from trials at different locations will be needed to generate reliable results.

In conclusion, it is clear that research into break crops is essential if crop rotation practices are to improve in order to meet the targets of FH 2020 and the Tillage Sector Development Plan and to bridge the knowledge gaps that are currently holding back break crop production.

Break crop agronomy: The Teagasc / IFA grain levy break crop research programme

John Carroll, Dermot Forristal and Faisal Zahoor
Teagasc CELUP
Oak Park Crops Research

Why break crops?

- Ireland Crop Production:
  - In the past: Grass rotations on 'Mixed' farms
  - Sugar beet gone
  - Break crops: 9.6% of arable area
- Continuous cereal production for 15 - 30 years
- Need for Rotations
  - Fertility
  - Disease breaks
  - More crop / market choices
- Address protein deficit

EU and national policy

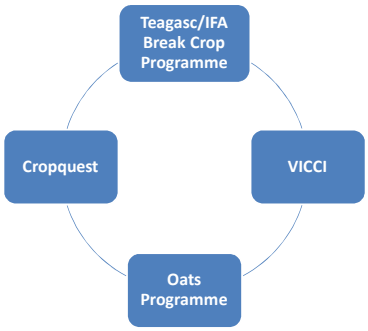
- EU/government regulations and support
  - Greening
  - EFA
  - Protein supplement

Tillage Sector Development Plan

- Feeding into H2020 + future strategies
- Identified need for break crops
- Identified need for break crop research

➡ Change of direction in research programme

Teagasc break crops research



Teagasc/IFA break crop programme

- Bean Agronomy (populations, disease etc)
  - Proposals to expand beans from 2015 (PhDs)
- Sugar Beet varieties
- Oilseed Rape
  - Crop Establishment Systems
    - Conventional vs Min Till vs Subsoiler
    - Row spacing etc.
    - Crop growth and yield and GHG emissions
  - Disease control

(D. Forristal, J. Spink, L. Glynn, G. Lanigan, PhD students)

CropQuest

- DAFM funded desk study (2 year – half way through)
- Review opportunities for break crops
- Including new market options

(J. Carroll, F. Zahoor, D. Forristal)

Oats

- New Programme 2015
  - Yield and quality
  - Lodging
  - Mycotoxins

(J. Finnan)

Break crop benefits

Are break crops beneficial?

- Research very limited
- International review conducted through CropQuest
- Systems/rotation trial in Knockbeg

Break crop benefits

Disease

Yield benefit will vary depending on crop, soil, climatic and environmental conditions

Nutrient → **Yield** ← Weed

Soil

Environmental

Knockbeg systems trial (1996 – 2011)

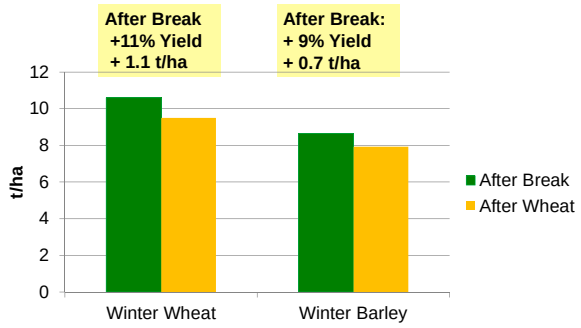
Winter Wheat

- Continuous Wheat
- Wheat following Beans
- Wheat following Oats

Winter Barley

- W.Barley following W.Wheat
- W.Barley following S. OSR

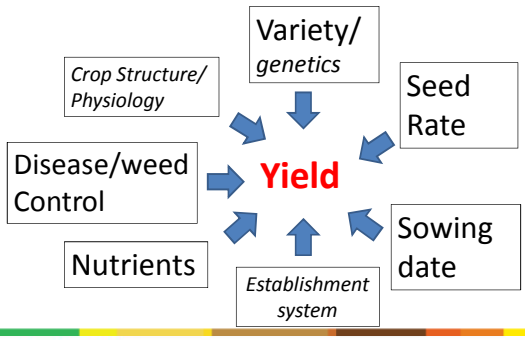
Yields after break crops



Difficulties with bean agronomy

- Ideal sowing method/date not well defined
- Difficult to achieve the ideal plant stand
  - Correct plant structure for optimum yield formation?
  - (Too thin or too thick)
- Lack of disease/weed control options
- Late harvest

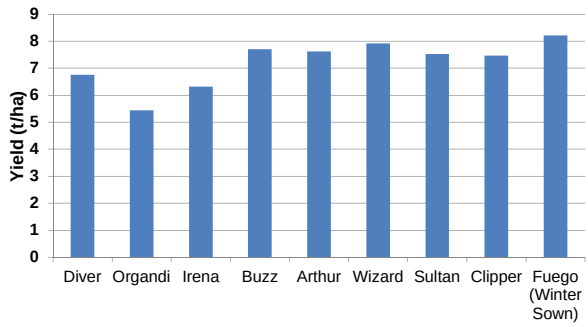
Field bean agronomy



Field beans

- Initial research programme Spring 2014
- Only 1 year of results
  - Winter: Variety comparison
  - Spring:
    - Seed rate
    - N application at sowing
    - Disease control
    - Flowering control

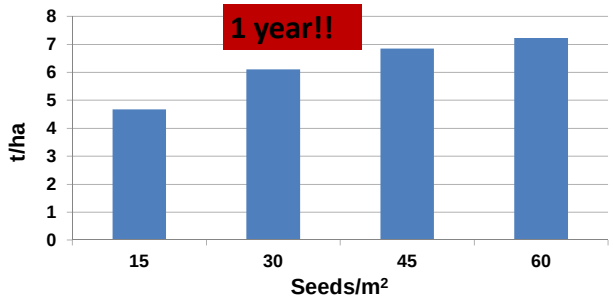
Winter bean varieties 2014



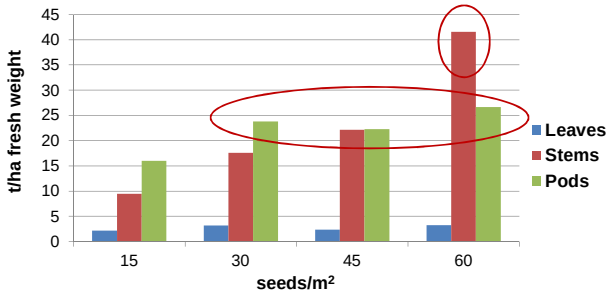
Seed rate & early N (2014)

- 4 seed rates (15, 30, 45, 60 seeds/m^2)
- 3 N rates (0, 20, 40 kg/ha)
- Measurements
  - Establishment
  - No. leaves/flowers/pods over time
  - Height/LAI/Biomass
  - Yield

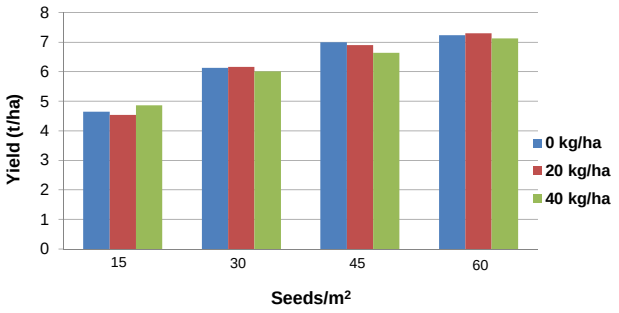
Yield vs. seed rate (March sown)



Higher seed rates give more vegetative growth



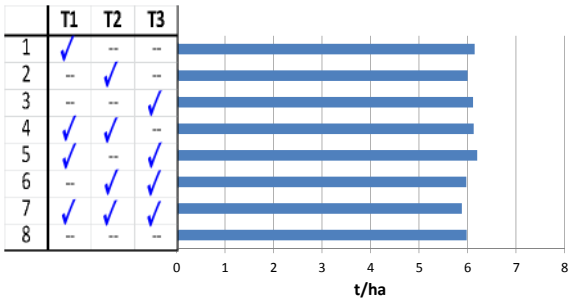
N had no effect on yield (2014)



Disease control:2014

- Chocolate spot on spring beans
- Fungicide timing trial (Signum @ 0.75kg/ha)
  - Flowering
  - + 3 weeks
  - + 6 weeks
- 2014 very low levels of disease

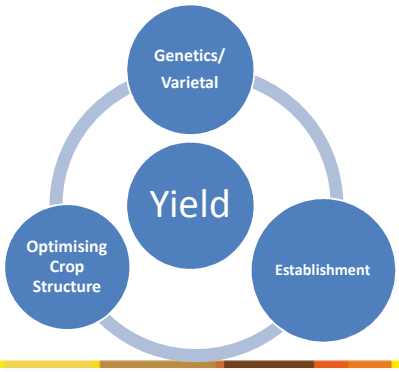
Fungicide treatment had no effect on yield in 2014



2015 research programme

- As 2014 + sowing dates

Future research



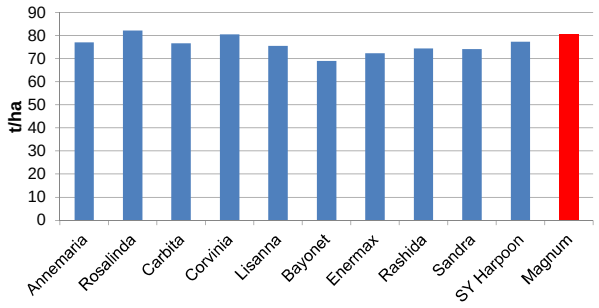
Varieties

- Very limited breeding work for 20 years.
- Virtual Irish Centre for Crop Improvements (VICCI) – DAFM (RSF)
  - Work Package 4: Task 4.1
  - Breeding for ascochyta resistance and yield
  - PhD student in collaboration with Reading Uni

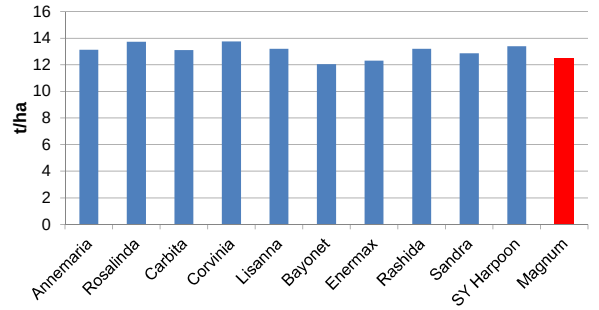
Sugar beet

- Variety trial
  - Oak Park (replicated) + 5 farm sites
- 10 new varieties
- Reported increase in yields since sugar beet last grown in Ireland
- Possibility of new sugar industry??

Root yields at 22.5% DM (Oak Park)



Sugar yields



Soil suitability

- Medium to heavy soils are most suitable
- Need good soil moisture levels for top yields - can suffer drought stress
- A pH of 6.5 to 7 is ideal. Will not yield in acid conditions
- Apply P & K according to soil analysis
- Watch - Magnesium, Zinc, and Manganese

Varieties, seed rate and sowing date

- Seed availability?
  - Fuego most common
  - Fanfare, Vertigo
- Aim for 25 – 30 plants/m^2
  - Large variation in TGW
  - 150 – 200 kg/ha (9 – 12.5 st/ac)
- Early Feb to mid-March

Planting beans

- Bird attack is a big threat
- Plant to a depth of 75 -100 cm (3 - 4")
- How?
  - Ploughing and drilling as normal
    - Use less coulters to get depth
  - Use strip till machines
    - Claydon, etc,
  - Shallow ploughing

Weed control

- **Not as easy as cereals**
- Use glyphosate before sowing for perennial weeds
- Residual products work best on fine seedbeds and re-activate with rainfall
- **Choices:**
  - Nirvana (pendimethalin + imazamox): 3.0 - 4.5 l/ha
  - Lingo (clomazone + linuron): 2.0 l/ha + 800 g ai/ha pendimethalin
  - Basagran is very limited in supply and spectrum, but is only post-emergence BLW option if necessary
- Grass weeds can be controlled effectively with appropriate graminicide

Bean weevil

- U-shaped notch
- Treat if damage is across all field
- 'Normal aphid spray'

Ascochyta

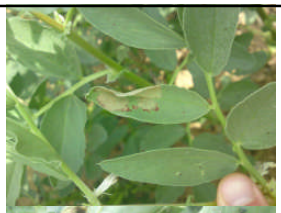
- Seed borne
  - Use certified seed
- Always in volunteers
- Chemical control variable

Chocolate spot

- Very common
- 2 spray programme
  - Flowering
  - + 2 – 3 weeks
  - Signum

Downy mildew

- Needs warm weather
- Blight type fungus
- Mancozeb (Dithane) at start of flowering



Bean aphid

- Late summer
- Very isolated
- Rarely needs treatment

Harvest

- Mid September to October
- Aim for < 18% M.C.
- Small % of green stems remaining

Conclusions

- Need for break crop research identified:
  - CROPQUEST desk study - 2013
  - OSR programme – 2013
  - Beet – 2014
  - Bean agronomy – 2014
  - Oats – 2015
  - Bean breeding - 2015

Acknowledgements

- IFA & farmers for paying the grain levy
- DAFM - RSF

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teagasc The Irish Agriculture and Food Development Authority

The spring barley guide

John Spink
Teagasc, CELUP, Oak Park
and
Ciaran Hickey
Teagasc Knowledge Transfer, Wexford

SUMMARY

Spring barley is Ireland's most widely grown tillage crop which provides valuable feedstock for the animal feed and malting industries. The crop is well suited to many of our soils and can perform consistently well in continuous production on farms that have limited break-crop opportunities. Ireland's climate and soils provide good yield potential, but wet conditions can present disease and machinery timeliness challenges. With a background of volatile grain prices, these favourable growing conditions must be fully exploited to ensure the crop is produced competitively and profitably. Yield must be optimised to increase output and to reduce the production cost per tonne produced.

Knowing how well a crop is growing and developing is vital for growers for the selection of the level of inputs required for an individual crop to maximise output and minimse costs of production.

To assit in this the guide is divided into two parts: The first describes the growth and development of nine reference crops grown between 2011 and 2013 and provides figures against which the progress of any crop can be judged. The second part provides the most up-to-date crop husbandry information to adjust management and maximise the return from a crop.

The reference crop data was collected from 'Quench' spring barley crops grown and frequently monitored at sites in Cork, Carlow and Wexford over three growing seasons from 2011 to 2013. The crops were sown between 10th March and 4th April, and managed to maximise yield. The figures and data presented give the average, and range of values, for indices of crop growth and development of these crops.

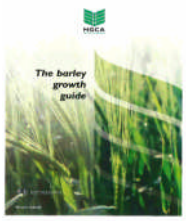
The values are not targets for crop growth. But they can be used as a guide against which the progress of a crop can be compared to assess whether it is ahead or behind normal progress.

The second part of the guide provides the most up-to-date agronomic information available. This information can be used to adjust management, either to maximise ear number in a crop, and therefore yield, or to reduce the costs of production where yield potential is low.

The Spring Barley Guide

John Spink
Teagasc CELUP
Oak Park Crops Research
and
Ciaran Hickey
Teagasc Knowledge Transfer, Wexford

Background



- Over recent years knowledge of winter wheat and barley has increased significantly

BUT

- Not spring barley
- Not in Irish Climate

Objectives

- Provide a detailed description of crop growth, development and yield formation
- Collate the latest crop management advice

Understanding crop growth and development

- Based on nine ‘reference crops’ grown and monitored 2011-2013
- Provides a quantitative description of the growth of an average crop
- Indicates the management required to optimise yield

Description and explanation of:

- Leaf emergence and tillering
- Canopy formation and light interception
- Biomass production and partitioning
- Crop Height
- Nitrogen uptake
- Ear formation and grain filling

Crop management

- Based on a large body of Teagasc research over recent years
- Collated into one place in an easily usable format

Areas covered

- Soil Cultivation
- Seed Rate and Establishment
- Nitrogen Management
- Crop Nutrition - Lime, P, K and micronutrients
- Weed Control
- Pests
- Disease control
- Economics
- Quality

- **Produced as part of a Department of Agriculture Food and the Marine – Stimulus project (CIVYL)**
  - Knowledge from a number of other projects
  - Input from Boortmalt on grain quality

Department of Agriculture, Food and the Marine
An Roinn Talmhaíochta, Bia agus Mara

BOORTMALT

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Notes: