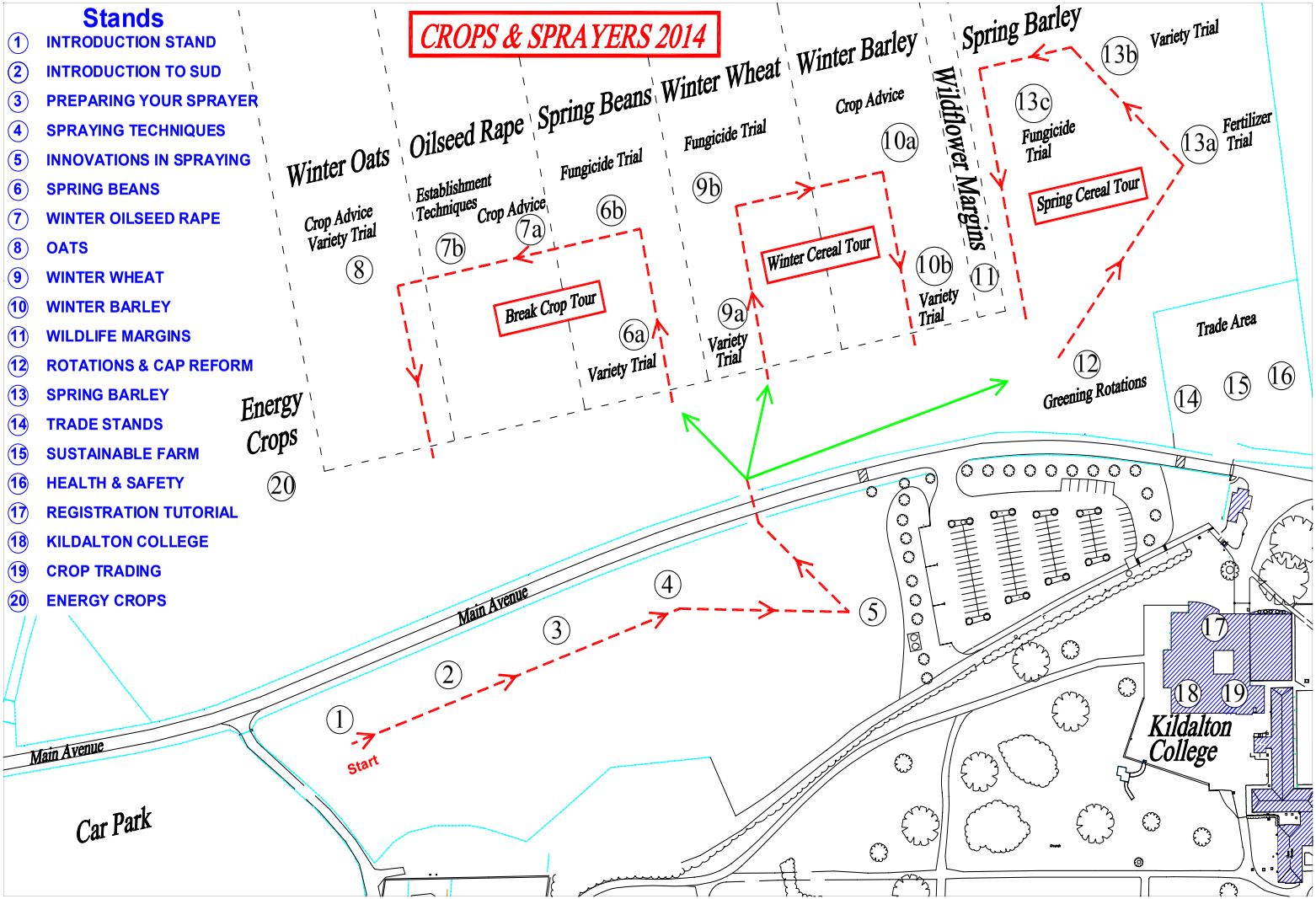
Teagasc
Crops Open Day 2014

Crops & Spraying '14

Kildalton College, Piltown, Co. Kilkenny
Thursday, 3rd July, 2014
11am - 4pm

Teagasc
Agriculture and Food Development Authority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Introduction

On behalf of Teagasc, we would like to welcome you to our Crops & Spraying event today, Thursday 3rd July 2014 in Teagasc, Kildalton College. The primary focus of this event is to inform tillage farmers about the latest technologies, business strategies and recently enacted legislative changes that will affect all tillage farms over the coming years. Technical improvements are at the core of the modern tillage business, but these must be tempered by return on investment and profitability. Tillage farmers know only too well the benefits of having a favourable environment when trying to achieve the highest cereal yields in the world, and enhancing that environment comes as second nature to them. However, there are increasing demands from the consumers of our products, the general public, that we produce products to the highest standards, while doing so in an environmentally benign and sustainable manner.

Two recent changes to the legislative framework, namely the Sustainable Use Directive and the 'greening' component of the CAP Reform, strive to reduce the effects of agriculture on the environment. Like all new rule changes, it will take time for farmers, advisors and trade personnel to be comfortable with the new terminology and adapt it to suit individual situations. Today is the first major forum where both will be discussed, explained and made 'real' by live demonstrations and plot experiments for you to see. We encourage you to take this opportunity to familiarise yourself with the new rules and discuss options with the experts on the various stands.

Each of the stands here today are focussed on increasing farm profits through improving your technical knowledge but also producing food and energy crops in a sustainable manner.

We hope you have an informative and enjoyable day and look forward to hearing your views and comments on the material being presented.

Tim O' Donovan
Jim O' Mahony
Teagasc

Contents

Introduction of SUD, Impacts on professional users, records required -

Gordon Rennick/Tom Medlycott/Sheila Mackin, DAFM

Background

The SUD provides a framework for community action to achieve the sustainable use of pesticides by reducing the risks and impacts of pesticides on human health and the environment and promoting the use of Integrated Pest Management (IPM).

Registration and Training

Any farmer or contractor who applies professional use plant protection products is deemed to be a Professional User (PU). All such individuals must be registered with the DAFM by 26th November 2015. From this date, only a registered PU can apply pesticides authorised for professional use.
In order to streamline and simplify future interactions with DAFM, it is recommended that existing DAFM clients who are not currently registered to use the DAFM online facilities should do so at ***www.agfood.ie.*** They can then register as a PU through ***www.agfood.ie.***
Other individuals who are not existing clients of the DAFM or who do not wish to use the DAFM agfood.ie online facilities should register using the online registration facility available for PUs on the PCS website ***(www.pcs.agriculture.gov.ie/SUD.htm)***

Note: You may be asked for proof of qualification at registration or subsequently at on-farm inspection.

Testing of Pesticide Application Equipment

All boom sprayers greater than 3m and all blast and orchard sprayers must be tested at least once by 26th November 2016. The interval between inspections must not exceed 5 years until 2020 and must not exceed 3 years thereafter. All equipment must be tested by a DAFM-registered Inspector of Pesticide Application Equipment.

Integrated Pest Management (IPM)

"IPM is a sustainable approach to managing pests by combining biological, cultural, physical and chemical tools in a way that minimizes economic, health, and environmental risks." (North Dakota State University)

The general principles of IPM are a set of guiding standards which are designed to help end users of PPPs to reduce reliance on PPP use and to reduce the risks associated with such use. They are easy to understand and easy to implement. All professional users of Plant Protection Products (PPPs) must operate to the "general principles" of IPM from January 1st 2014.

Records proving implementation of IPM must be maintained by all farmers/growers. If using a PPP the reason for using the PPP should be recorded. A template Plant Protection Product Use Record sheet and a whole farm level worksheet to record how the general principles of IPM are being applied are available on the PCS website ***(www.pcs.agriculture.gov.ie)***

Integrated Pest Management

You must follow these general principles:

The prevention/suppression of key pests, diseases and weeds achieved by:

- Choice of resistant/tolerant cultivars
- Crop rotation,
- Cultivation techniques, min-till, inversion tillage
- Crop nutrition and irrigation practices
- Protection of important natural enemies
- Monitor harmful organisms
- Decisions based on pest thresholds
- Preference for non chemical control
- PPP should be as targeted as possible with the least negative effects on man, animals or environment
- Minimise chemical control
- Use resistance management strategies
- **Maintain records!**

Sustainable Use of Pesticides Directive (SUD)

Provides a framework for community action to achieve the sustainable use of pesticides by reducing the risks and impacts of pesticides on human health and the environment and promoting the use of Integrated Pest Management (IPM).

Registration

All Professional Users must be registered by **26th November 2015**

- www.agfood.ie for DAFM clients
- Otherwise www.pcs.agriculture.gov.ie/SUD.htm
- Registered Pesticide Advisors eligible to register

Training

- FETAC Pesticide Application courses: 5N0731 – Handheld
  5N17997 – Boom Sprayer
- Teagasc Pesticide Application module (as part of a 1- or 2-year
- Teagasc qualification or stand-alone Teagasc course)

Testing of Pesticide Application Equipment

- Boom sprayers > 3m and blast and orchard sprayers must be tested by 26th November 2016
- Tested every 5 years up to 2020
- Tested every 3 years after 2020
- Must be tested by a DAFM-registered Inspector of Pesticide Application

Preparing your sprayer for the SUD test

James Maloney & Stuart Goodwin, Teagasc

Boom Sprayer Testing

- All sprayers with a least a 3 meter boom to be tested
- All sprayers to be tested by 26th November 2016
- Sprayer test will last for 5 years until 2020 and every 3 years after that
- Farmers responsibility to ensure sprayer is tested

Who carries out the test?

- Approved list of testers on www.pcs.agriculture.gov.ie
- The farmer is responsible for organising the test
- Every sprayer on the farm has to be tested
- The sprayer test certificate will remain with the sprayer if sold or replaced

Pre-Test Preparation for the Boom Sprayer

- The sprayer is in a safe condition prior to the test.
- The sprayer is decontaminated inside and out.
- Adequate supply of clean water available
- Appropriate hard standing area to test the sprayer with clean water.

Boom Sprayer Check List

The test will inspect the following components on the sprayer:

- Power transmission parts
- Pump
- Agitation
- Control systems
- Spray lines
- Filters
- Spray boom
- Nozzles
- Spray pattern

Spraying Application techniques, nozzle demonstration

Tom Gartland, Syngenta & Shay Phelan, Teagasc

Pesticide performance will not be as expected unless due care and attention is given to the spraying operation. Achieving the important effective result is a function of 3 main factors – A. Product Choice, B. Timing of Application, C. Application Technique. Before the spraying season begins, sprayers should be checked and calibrated. The nozzle chosen must provide the required coverage of chemical and also keep off-target drift to a minimum. Spray Booms should be set to operate at 50cm above the target for 1100 fan jets at 50cm spacing. Doubling the height increases drift by a factor of 10 and also reduces spray penetration and coverage into the crop.

Key Factors Affecting Spray Coverage:

1. Weather Conditions – Wind, Rain, Relative Humidity, Temperature, etc.
2. Crop Growth Stage
3. Nozzle
4. Boom Height

'Putting More Spray on the Target'

syngenta.

Key Factors Affecting Spray Coverage:

1. Weather Conditions – Wind, Rain, Relative Humidity, Temperature, etc.
2. Crop Growth Stage
3. Nozzle
4. Boom Height

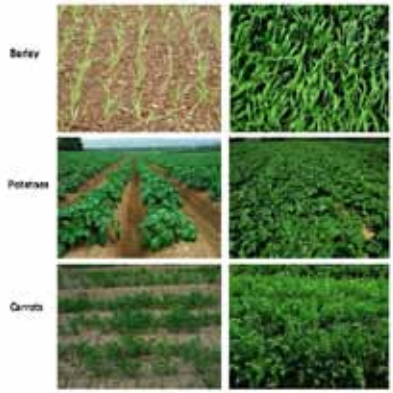
Leaf coverage of cereal fungicide applied at 110 l/ha

Leaf coverage of potato blight fungicide applied at 220 l/ha

1. Weather Conditions - Wind Speed

Approx. Wind Speed at Boom Height km/h	Description	Visible Signs	Spraying
Less than 3.0	Calm	Smoke rises vertically	Only use medium or coarse spray quality
3.0 – 3.2	Light Air	Direction shown by smoke drift	Acceptable spraying conditions
3.2 – 6.5	Light Breeze	Leaves rustle, wind felt on face	Ideal spraying conditions
6.5 – 9.6	Gentle Breeze	Leaves and twigs in constant motion	Increased risk of spray drift
9.6 – 14.5	Moderate	Small branches moved, raises dust or loose paper	Spraying inadvisable

2. Crop Growth Stage



syngenta.
www.syngenta.ie

Innovations from Sprayer Operator of the Year winners & finalists - *Andy Doyle, IFJ & Tom Ryan, Teagasc*

Depending on the crops you grow, individual farmers may put between €60/ac and €350/ac worth of chemicals through a sprayer each year.

Getting the most from these inputs is critical to profitability and growers must now comply with an increasing amount of control legislation.

Weather is obviously an important influence on spraying and practical considerations must always be taken into account when striking a balance between the need for timely application, optimum conditions and care for the environment.

Being well organised is an important part of the job of spraying. This is mainly a practical process and in recent years the Sprayer Operator of the Year Award sought to identify good spraying practices that help the timeliness and efficiency of the spray application.

But it is also important to keep the operator and environment safe whilst maintaining compliance with legislative requirements.

This station looks at a number of the useful devices and practices identified on these farms and some of the previous winners will be present for discussion.

Devices to help transport and fill chemicals safely, carry clean water, record chemical usage, clean nozzles, wash sprayers, rinse cans, etc.

All of these issues are important for the modern sprayer operator.

Spraying

Little things can make a difference. Each application needs to be:

- Safe for the operator
- Effective on the crop
- Kind to the environment

Some of the handy devices found on farms while judging the Sprayer Operator of the Year Competition

Safe handling: Safe storage; Safety clothing, gloves, face shield and other equipment



Record with accuracy: Note book; Palm devices; Cloud device on smart phone.

Prevent losses: Triple Rinse cans; Contain drips. Minimise drift



Operate safely: Be seen, stay safe (PTO), don't get crushed, avoid fast sharp cornering with trailed sprayers. Careful transport of products.



Crop Variety Evaluation - *DAFM Staff*

The principal role of Crop Variety Testing is to trial new cereal varieties put forward by breeders / seed agents for trialing. Varieties are evaluated for a minimum of 2 years on National List trials before the most promising varieties from National List trials enter Recommended List Trials. All varieties are evaluated on relative yield, straw quality, time of ripening, sprouting, disease resistance, grain quality, etc. Both the National List and Recommended Lists trials cover a wide geographic spread from the Departments Variety Evaluation Centers at Backweston, Moorepark & Kildalton to commercial farms so that differences in climate, soil type, and other factors, are taken into account when evaluating a variety.

Having completed a minimum of two years in Recommended List trials and at least one year in National List trials the variety is then eligible for inclusion in the Department's Recommended List. Varieties included for the first time are provisionally recommended and can achieve full recommendation after a further one, two or exceptionally three years. A variety may be removed from the List at any stage if its relative performance falls below the general standard of other varieties or due to lack of availability of seed.

Seeding rate trial & oat husbandry, high quality oats for export - *Dick O'Shea, Teagasc*

Traditionally Oat Crops were grown mainly for horse feed and for milling markets, this still holds true but more lucrative milling markets are now available only for limited quantities at present.

Glanbia, Flahavans/Bretts and Connolly's Red Mills are the main assemblers of oats in the cereal growing area of the county. Quality is the all important factor for these outlets. KPH is the main indication of quality and all require a base of 52 KPH.

Margins from oats compares very favourably with wheat and barley but the quantity required for the market is easily supplied by the 23,000 ha. (Winter & Spring) grown at present.

The standard agronomy for oats is a seed rate of 155 kg/ha., P & K based on soil test and a total N of 140 kg/ha for winter and 110 kg/ha for spring sown. A three spray programme for disease control targeting mildew and crown rust. Growth regulation is very important with the main application at growth stage 32.

Oat Mosaic Virus is a big threat and can only be controlled by rotation with at least a three year break between oat crops.

Winter or spring crops? Winter has a plus for yield and quality but these just about cover the extra cost of production.

Secure a market if you are considering growing oats for the first time.

Market for Oats

- Plentiful Supply at Present

- Secure a Market
  - Glanbia
  - Flahavans/Bretts
  - Connollys Red Mills

- Quality is Crucial
  - KPH 52+
  - No Admixture
  - Wild Oats

Oats Production

Winter vs Spring

- Same Varieties/Winter Hardiness
- Winter Costs - €100/ha more
- Yield Winter – +0.5 tonnes/ha
- KPH Winter – +2 points
- Harvest - +3 weeks

Winter Oilseed Rape

Establishment techniques - *Dermot Forristal, Teagasc*

Oilseed Rape Establishment

Needs

- Good establishment; Even plant distribution
- Soil structure for root growth
- Weed control; Slug control
- Moisture retention; Drainage
- Low cost; Reliable, Convenient

2012

	Plants (Aut)	LAI (Feb)	Yield (9% mc)
Plough	66	1.13	3.7
Min Till	64	0.81	3.8
Subsoiler	66	1.11	3.6

Plough 125mm spacing

Subsoiler 600mm

OSR Establishment Trials

Systems:

- Standard Plough-based: 125mm, 600mm row spacing
- Minimum tillage: 125mm, 600mm row spacing
- Subsoiler establishment: 600mm row spacing

Combined with:

- Nitrogen: 5 rates (+/- Autumn N)
- Management strategies (Canopy management+ Growth regs)
- Weed control strategies

Assessments:

- Crop performance: Establishment, Canopy, Structure, Yield
- Greenhouse gases: CO2, NO2, LCA etc
- Soil Microbiome: Beneficial soil/root microbiota

Winter Oilseed Rape

Early Season Agronomy - *Martin Bourke, Teagasc*

Teagasc
Agriculture and Food Development Authority

Oilseed Rape Management

Establishment

- Roots sensitive to compaction – deep cultivations may be needed
- Drill early – Pigeons, weed competition, slugs, N scavenging
- Establish 30 plants/m2 in spring

Canopy Management

- Moderately sized crops yield best
- Target canopy size 3.5 GAI at start of flowering
- Need 50 kgN/ha from soil or fertiliser to make 1 GAI

Fungicide Use

- Phoma (10-20% plants infected) and LLS (>25% plants infected) treat in autumn
- Follow up in spring if re-infection

Spring Beans

John Carroll & Eamonn Lynch, Teagasc

Beans: Current Research (OP)

Renewed Interest:

- Lack of break crops and protein crops
- Tillage Sector Development Plan
- CAP Greening and coupled payments

Break crop benefits

- Disease (take-all) break
- Nitrogen fixation
- Yield benefits to cereals

Potential issues

- Suitable varieties
- Disease/Weed control options
- Yield variability

On-going research:

- Seed rate and seedbed N trial
  15, 30, 45, 60 seeds/m^2 and 0, 20, 40 kg N/ha
- Flowering control trial
  to determine contribution of plant

Fungicide Timing Trial

Trial Plan:

- Chocolate spot: target disease
- All combinations of 3 timings inc control
- Signum @ 0.75kg/ha
- 5 replications
- T1: 26th May, T2: 16th June, T3:+3 weeks
- Similar trial at Oak Park

Plot	T1	T2	T3
1	x	-	-
2	-	x	-
3	-	-	x
4	x	x	-
5	x	-	x
6	-	x	x
7	x	x	x
8	-	-	-

Assessments:

- Crop performance: Canopy Structure, Yield
- Disease assessments: Scoring for chocolate spot

Beans - General Agronomy

Sowing Date — Sow from Mid January to Mid March

Seeding Rate — Aim to sow between 35 & 40 seeds/m^2 to achieve an optimum plant density at 25-35 plants/m^2

T.G.W. — Can be variable adjust seeding rates based on TGW and germination %

Nutrition

Soil P & K Index	P	K
1	50	125
2	40	60
3	20	40
4	None	None

WEED CONTROL

- Mainly Pre Emergence using Nirvana or Lingo or a mixture of both (Need Fine Seedbed for Best Control)
- Avoid spray overlaps as it can cause a bleaching of leaves.
- Use suitable Graminicides for wild oat & scutch control.

DISEASE CONTROL

- Three main diseases in Ireland,
  1) Chocolate Spot, 2) Downy Mildew and 3) Ascochyta.
- Chocolate Spot is biggest threat –
  spray at early flowering or first sign of infection.

Pests

- Pea & Bean Weevil cause a U-shaped notch on leaves, larvae bury into soil and feed on roots.
- Apply suitable insecticide if notching is seen across fields.
- Black Bean Aphid – only spray if > 5% of plants are affected evenly across the field.

Harvesting

- Late August – Mid September
- Aim for 18% moisture content

Energy Crops

Barry Caslin, Teagasc

Increasing demand for biomass within Ireland can only be met by developing an energy crop sector as supplies of biomass from forestry are limited.

The two most popular energy crops are willow and miscanthus. Both are perennial crops which can be expected to remain productive for twenty years, establishment grants are available to assist with the costs of establishment.

Willow and miscanthus typically take until the third year after sowing before full yield potential is reached.

The principal inputs after sowing are herbicides and nutrients. Herbicides are essential for both crops to ensure good weed control particularly during the early years after establishment. Nutrient inputs are also essential to build –up and maintain good soil nutrient reserves even though nutrient inputs are low compared to other crops.

Miscanthus is harvested annually either by mowing and baling or by using a forage harvester with a kemper header whereas willow is harvested every 2/3 years typically with a forage harvester equipped with a specialised header.

Like all crops, yields will depend on crop management, soil type and weather conditions.

Low yields will be obtained if crops are grown on less suitable soils or if crop management is not optimised.

However, properly managed crops of both miscanthus and willows grown on good soils have been shown to yield up to 12 tonnes of dry matter per hectare per year.

Why Energy Crops?

- Global warming → Kyoto agreement
- Depletion of fossil fuels → Fuel security
  → Increasing energy prices

National Targets

- Co-firing electricity targets – 30% by 2015
- Transport biofuel targets – 10% by 2020
- Renewable heat targets – 12% by 2020

BUT

- Markets in their infancy
- Price



Mischanthus

Pros

- Conventional harvesting machinery
- Low nutrient requirement
- Wide range of herbicides
- Low moisture content potential
- High yields (8-15t / ha)
- Annual harvests
- Baled for transport
- Energy content 13.7 GJ/tonne (@ 20% MC)

Cons

- Specialised planting machinery
- Wireworm in grassland
- High establishment costs
- High ash content (2.7%)
- Specialised boilers for end combustion
- Only 1 clone commercially available
- Harvest losses/moisture content



Willow

Pros

- Bio-filtration possibility
- Moderate ash content (< 1%)
- Wide range of boilers
- Can be burnt moist
- Energy content 6.9 GJ/tonne (@ 55% MC)
- Long term local resource

Cons

- Specialised planting and harvesting machinery
- Weed control limited
- Pest and disease risk
- Yr1 cut-back required
- High establishment costs
- Two – three year cycle
- High harvest moisture (Drying required)



Fungicide Strategies - *Steven Kildea & John Pettit, Teagasc*

Winter Wheat Disease Control

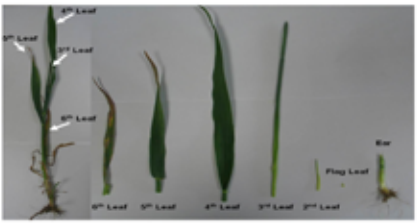
Aim of fungicide programmes are to protect potential yields

Timing is critical!

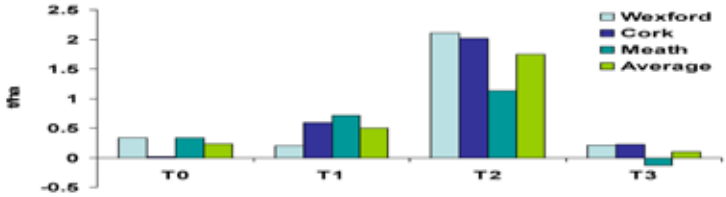
T1: 3rd leaf fully emerged

T2: Flag leaf fully emerged

T3: Mid way through flowering



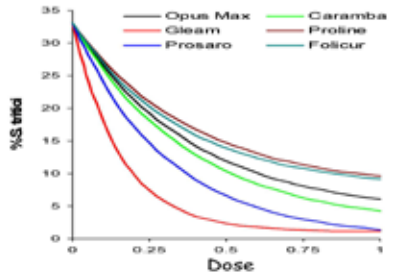
Controlling disease on flag leaf is essential

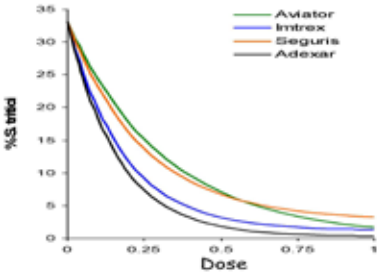


Yield response from each application

Fungicide Choice?

Teagasc Fungicide Dose Response 2012





Fungicide Programmes

Timing	Targets	Fungicides
T0	Foliar (& Stem) Diseases	Ctl (± strob/morph for rust control)
T1	Foliar & Stem Diseases	Triazole + Ctl (± SDHI)
T2	Foliar Diseases	Triazole + SDHI + Ctl
T3	Ear & Foliar Diseases	Triazole (± Ctl)

Agronomy, fungicide trial results - *Jim O'Neill/Ciaran Collins, Teagasc*

Yield in both winter and spring barley largely determined by grain number per unit ground area, as there is invariably more than enough carbohydrate to fill the grains during grain filling. There is limited flexibility in grain number per ear so a high ear number per unit area is necessary for high yield.

Early disease development in a crop will reduce light interception and limit tiller production or result in excessive tiller death. Controlling disease as soon as it appears is therefore important, and keeping an eye on the crop to treat again if disease re-establishes, there is no need to stick to a predetermined spray interval once the first treatment has been applied. Because there is more than enough carbohydrate to fill the grains the response to late sprays is negligible.

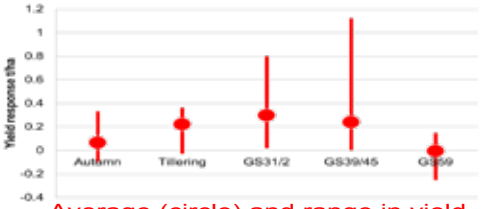
There are a wide range of good active ingredients and fungicides available for barley disease control. If disease is well established at the time of spraying then a product with a triazole included will give the best eradicant activity.

SDHIs have added useful disease control benefits over products that were available just a couple of years ago and are worth including on crops with good potential or when disease pressure is high.
As with any disease control programme the use of mixtures and sequences of different active ingredients is critical to achieve good disease control and avoid resistance development.

Winter barley- disease control

Use fungicides to:

1. **Increase yield potential**
2. **Control disease to achieve yield potential**



Average (circle) and range in yield response

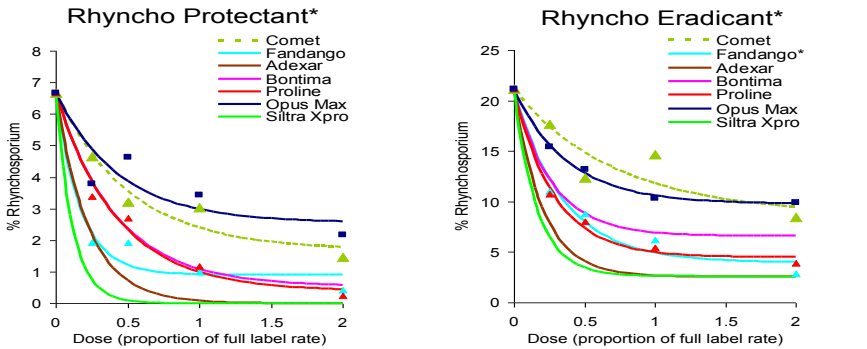
- Timing trial carried out on cv. Saffron in Oak Park and Cork in 2010-2013
- Tillering, stem extension and awn emergence applications all gave significant increases in yield.
- Yield responses not as large as expected.

Take home messages

1. Don't delay disease control

2. Little justification for delaying last spray until ear emergence

Fungicide choice?



*Based on 2009-2011 data, 7 sites, including Teagasc data

- Wide range of useful fungicides available for barley
- Always include at least 2 active ingredients
- Use a triazole where disease is already established
- Over reliance on triazoles risks resistance development
- Add specific mildewicide where required in early sprays

Protecting pollinators & wildflower margins -
Catherine Keena, Teagasc

Mind your pollinators

Pollination is the transfer of pollen from a flower's male organs to a flower's female organs, a process that is critical to fruit and seed production. Some plants pollinate themselves by having the male portion of the blossom grow into contact with the female portion. Cereals and most trees are pollinated by the wind. Bees in general pollinate some 90% of the world's commercial plants, including most fruits, vegetables and nuts. On Irish farms, oilseed rape, peas and beans are pollinated by flying insects such as hoverflies and bees.

There are 101 species of bee in Ireland: 81 solitary bees, 19 bumblebees and one native species of honeybee. However, more than half of Ireland's bee species have undergone substantial declines in their numbers since 1980. Three species have become extinct, six are critically endangered, ten endangered and fourteen vulnerable.

When spraying, the key message is to follow instructions on the pesticide label. Labelling requirements on the proper safety precautions for the protection of human or animal health (EC Reg. 11077/2009 and EC Reg. 547/2011) involve phrases such as: Dangerous to bees / To protect bees and other pollinating insects do not apply to crop plants when in flower / Do not use where bees are actively foraging / Remove or cover beehives during application and for stated time after treatment / Do not apply when flowering weeds are present / Remove weeds before flowering / Do not apply before stated time.

- Read and flow the label instructions for all sprays.
- Use pesticides only when needed, avoid flowering time where possible.
- When crops or other plants in the field margins are in flower, apply pollinator toxic pesticides late in the evening to minimise exposure to pollinators.
- Avoid spraying areas where wild pollinators live such as hedgerows and field margins.
- Avoid spray drift by using low-drift nozzles/sprayer equipment and applying under suitable weather conditions.
- Establish good relations and communication with local beekeepers.

Sow wildflowers or allow regenerate naturally in field margins.

Use rodenticides responsibly

Rodents, especially rats, can be a serious problem on farms. Rodenticides are the most common means of controlling rat infestations. However, rat poisons are also toxic to other wildlife, domestic livestock and pets. Birds of prey are particularly susceptible. Recent research has highlighted secondary poisoning from rodenticides to be a serious concern for barn owls, with the majority of the population in Ireland exposed to these toxins. Some birds of prey like buzzards and red kites can be exposed to rodenticides from scavenging on dead rats, but the problem also occurs when birds such as barn owl and kestrel catch live rats which have been contaminated and the poisons then accumulate in their systems.

Reduce the threat of rodenticide poisoning to wildlife on your farm

- ***Always have a planned approach.***
  Before treatment begins carry out a thorough assessment of the infested site. Reduce the attractiveness of the site for rodents by rodent proofing buildings, removing rubbish and food sources such as spilt grain.
- ***Only bait for as long as is necessary.***
  Avoid permanent baiting and only use rodenticides when required and after applying the measures above. Never leave bait down at the end of the treatment. In most cases the bait should have achieved control within 35 days.
- ***Always record the quantity of bait used and where it is placed.***
  By carefully recording the locations of all bait points, responsible users of rodenticides can return to these sites at the end of treatment and remove uneaten bait so that it does not become available to wildlife.
- ***Always use enough baiting points.***
  Controlling the infestation efficiently and in the shortest possible time will restrict the duration of exposure of non-target wildlife.
- ***Always collect and dispose of rodent bodies.***
  The bodies of dead rodents may carry residues of rodenticides and cause secondary poisoning of any bird or animal which subsequently feeds on it.
- ***Never leave bait exposed to non-target animals and birds.***
  Care should be taken to ensure bait is sufficiently protected, using natural materials if possible or else bait stations
- ***When the infestation has been cleared, implement preventative measures such as:***
  - Clearing the site of rubbish and clutter that provide shelter for rodents
  - Clearing overgrown areas around the site that may hide rat burrows
  - Making inaccessible to rodents all potential sources of food
  - Storing produce off the ground on pallets & stack to allow inspection on all sides
  - Initiate & document regular good house-keeping checks'

Pollination in Ireland

- Flying insects - Oilseed Rape, Beans, Peas
- Wind - most trees and all cereals
- Self-pollination. Some plants pollinate themselves by having the male portion of the blossom grow into contact with the female portion.

Honeybee (1) Bumblebees (19) Solitary Bees (81) Hoverflies

100 Native Bee Species in Ireland BUT....

More than half of Ireland's bee species have undergone substantial declines in their numbers since 1980.

- 3 species have become extinct
- 6 species are critically endangered
- 10 endangered
- 14 vulnerable

Mind your Pollinators

- Follow label instructions for sprays
- Use pesticides only when needed
- Apply pollinator toxic pesticides late in the evening
- Avoid spraying hedgerows and margins
- Avoid spray drift
- Increase buffer / non-sprayed zones
- Communicate with local beekeepers
- Sow flower strips or allow areas regenerate naturally

Rotations & CAP Reform - *Michael Hennessy & Phelim McDonald*

The new CAP reform will introduce major changes onto tillage farming next year. These changes will affect all farmers and will place an extra burden at farm level to monitor the area, type and ratio of crop sown and the areas referred to as Ecological Focus Areas (EFA). For many farmers the changes required on farm will be minimal, for others the changes will be substantial.

From 2015, the new Single Farm Payment will be divided into two, with 70% paid as a basic scheme, and 30% paid if the "Greening Rules" are fulfilled. Growers with more than 75% of permanent pasture on their holdings are exempt from Greening rules. However farmers who plant between 10 and 20 hectares of crops will be required to have at least two crops, with no one crop greater than 75%.

If a farmer plants over 30 hectares then 3 crops are required with no one crop exceeding 75% and two crops cannot exceed 95%.

This is a very simple representation of the rules and the talks on the day will explain the rules further.

As most growers are required to have more than one crop this has a potential to create a rotation on farm.
This may be beneficial as a good rotation has the potential to stabilise yields, spread risk, reduce difficult to control weeds/diseases/pests, spread workload, etc.

However the construction of a rotation needs to be undertaken carefully. Soil type, access to markets, volunteers, problematic weeds, grower expertise, etc. all need to be considered before committing to a rotation.

The boards outline possible rotations which may fit some farms but all rotations should be farm specific.

The boards outline how these rotations fit into with the new rules and the potential margin from the entire rotation.

Rotations: How do I choose?

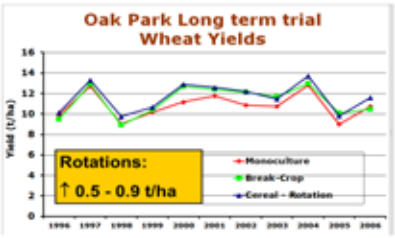
IPM Benefits/Concerns

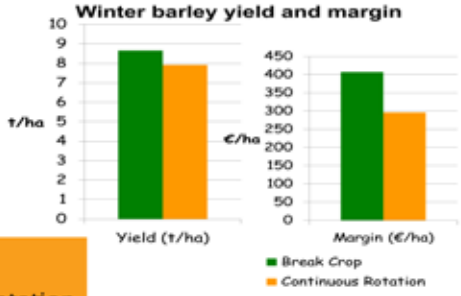
- Disease (Take all)
- Volunteer weeds
- Disease carry over
- Fertility issues

Importance of a good rotation

- Profitability
- Diversify risks
- Fulfil greening regulations
- Effective use of herbicides on difficult weeds
- Soil structure benefits

Yields & Margins: Long term Oak Park trials





Key Messages

- Rotations are farm specific
- Assess overall financial margin of rotation

Winter Rotation

	Yield t/ha (t/ac)	% of Area	Margin €/ha	Margin €/ac
Oilseed rape	4.4 (1.8)	14%	531	215
Winter Wheat	10.4 (4.2)	28%	346	140
Winter Barley	9.4 (3.8)	42%	321	130
Winter Oats	9.3 (3.75)	14%	351	142
Average Margin			**363**	**147**

Greening Rules	
3 Crop Rule	✓
Main crop < 75%	✓
One crop >5%	✓

Spring Rotation

	Yield t/ha (t/ac)	% of Area	Margin €/ha	Margin €/ac
Oilseed rape	3.0 (1.2)	17%	255	103
Spring Wheat	7.9 (3.2)	34%	245	99
Spring Feed Barley	7.4 (3.0)	34%	190	77
Spring Oats	9.3 (3.75)	17%	183	74
Average Margin			**218**	**88**

Greening Rules	
3 Crop Rule	✓
Main crop < 75%	✓
One crop > 5%	✓

Winter/Spring Rotation

	Yield t/ha (t/ac)	% of Area	Margin/ha	Margin €/ac
Oilseed rape	3.0 (1.2)	14%	255	103
Winter Wheat	10.4 (4.2)	28%	346	140
Winter Barley	9.4 (3.8)	42%	292	130
Fodder Beet	74 (30)	14%	655	265
Average Margin			**366**	**148**

Greening Rules	
3 Crop Rule	✓
Main crop < 75%	✓
One crop >5%	✓

Malting Barley/Simple Plan - 100 hectare farm

	Yield t/ha (t/ac)	% of Area	Margin/ha	Margin €/ac
S. Malt Barley	3.0 (1.2)	72%	324	131
Winter Barley	9.4 (3.8)	22%	321	130
Temp. Grassland	8 X (4x4)	(6%)	(301)	(122)
Spring Beans	4.9 (2.0)	(6%)	(178)	(72)
Average Margin			?	?

Greening Rules	
3 Crop Rule	✓
Main crop < 75%	✓
One crop >5%	✓

Spring Barley

Fertiliser Management - *Mark Plunkett & David Wall, Teagasc*

Productive soils are the foundation of any successful farm. The ability of soils to maintain a supply of nutrients in the appropriate quantities for cereal production is a key factor in determining how productive a field or farm can be. Fertilizer costs account for approximately 40 to 50% of variable costs of production for winter and spring cereal crops, but can provide good value for money when used correctly. However, fertilizer application rates that are either too low, too high, or not in balance with other soil fertility factors will give lower responses. With soil phosphorus (P) and potassium (K) levels declining on many farms in recent years, the importance of soil fertility management has increased.

Effective nutrient management is one of the first steps in integrated pest management (IPM). Soil fertility can have a large effect on crop establishment, crop health and ultimately crop yield and quality. Rapid root development and sufficient tiller production linked to nutrient availability in early stages of cereal development is the foundation to building the yield potential in crop production systems and will reduce the risk/susceptibility of pest/disease damage during all stages of development.

Soil fertility Management – 5 steps to follow

1) Soil test

A soil test will indicate the background soil fertility levels of pH, P and K and also Mg and trace elements where required. The primary function of soil testing on the farm should be to improve soil fertility information and to plan fertilizer applications. Unless you know what is in the soil, it is impossible to know how much fertilizer it needs. Therefore, by taking soil analysis and putting the results into practice, the fertilizer programme can be tailored to the needs of the soil and the farm. Repeating soil analysis over time is also critical to monitor how well your fertilizer strategy is working to maintain soil fertility levels.

2) Apply Lime

Soil pH is the first thing to get right. The release of nutrients from the soil and the response to applied fertilizers will be reduced where the soil pH is low (or too high). Apply lime as required to increase soil pH up to target pH for the most pH sensitive crop in the rotation. The optimum soil pH for cereals is at pH 6.5. It is important not to

over-apply lime as it can affect trace element (esp. manganese) availability in soils if applied in excess.

3) Target Index 3 for P and K

Soil analysis is designed to estimate the proportion of P and K that is present in the soil in a plant-available form. Aim to have soil P and K fertility levels in Index 3 in all fields. High fertility soils (Index 4) are a resource and should be utilised. Low fertility soils (Index 1 or 2) need to be nurtured. For soils in Index 3 the fertilizer program should be designed to replace the nutrients being removed at harvest time in grain and straw, thus maintaining the soil fertility level.

4) Organic Manures

Slurry / FYM etc.. are valuable sources of N, P, K, S, Mg and minor nutrients. The nutrient content of organic manures can be highly variable, especially for liquid manures (slurries) usually due to dilution with water. However, manures are a cost effective source of N, P & K and are a valuable resource for building soil fertility levels. Where available target manures to fields that have high P and K requirements (fields with P and K Index 1 or 2) and top up with fertilizer as required.

5) Fertilizer products that give a balanced nutrient supply

Soil fertility needs to be managed on a long term basis with the aim of maintaining optimum soil fertility levels for soil pH, P, K, Mg, Mn, Cu and Zn to ensure efficient use of all other inputs applied during the growing season in producing high grain yields. Make sure the fertilizer compound is supplying nutrients in the correct balance for the crop, the soil, and to complement other fertilizers being applied. If one nutrient is deficient, no amount of another nutrient will overcome this. For example, if a field is deficient in K, then crop N applied will not be fully utilised. Other nutrients such as Sulphur are very important in cereal production especially on continuously tilled light soils or soils with low soil organic matter levels.

Conclusions

Implementing these simple steps for soil fertility management will go a long way to ensuring that the production potential of the farm is being realised, and that fertilizer inputs are being utilised as efficiently as possible.

Soil Fertility Management on Tillage Farms

CELUP Johnstown Castle

• pH & Lime

Importance
- Increased soil nutrient availability at target soil pH levels (i.e. pH 6.5)
- Lime is an important source Ca & Mg and neutralizes soil acidity

Management
- Apply lime as recommended on the soil test report
- More frequent liming may be needed on free draining soils receiving high N applications.
- Increased N mineralization at target soil pH levels

Potential Risks
- High P fixation and reduced nutrient availability at low soil pH
- Over application of lime (pH > 7.0) may reduce trace element availability

• Nitrogen (N)

Importance
- Drives high grain yields
- Linked with grain protein levels

Management
- Match N fertiliser rates to crop yield potential
- Adjust rates based on soil N index and slurry applications
- Timing of N application is critical for tillering and grain protein levels.

Potential Risks
- Higher lodging risk at high N applications
- Increased susceptibility to disease in lush crops with high N applications
- Excess N can be lost to the environment and lead to reduced profits.

• Phosphorus (P)

Importance
- Essential for root development and plant establishment
- Drives plant cell growth and energy production

Management
- Apply P fertilisers based on soil test results
- Apply P in spring to coincide with the onset of crop growth
- Combine drill/ incorporate P into seedbed when soil P levels are low
- Apply crop offtake +/- build-up P applications to maintain soil P levels

Potential Risks
- Poor crop establishment at low soil test P levels
- Delayed leaf emergence and reduced seed production and grain yield
- Excess P can be lost to the environment and lead to reduced profits.

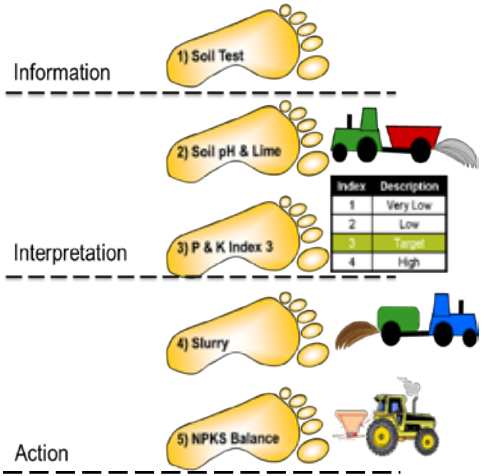
• Potassium (K)

Importance
- Essential for protein development and leaf and stem production
- Maintains plant cell structure and facilitates nutrient assimilation

Management
- Apply K fertilisers based on soil test results
- Adequate K supply required from stem elongation onwards
- High yielding cereals have a high K requirement
- Apply crop offtake +/- build-up K applications to maintain soil K levels

Potential Risks
- Increased lodging and disease risk at low soil K levels
- Poor N use efficiency and drought tolerance if K is limited

5 Steps for Improving Soil Fertility



• Other Essential Nutrients

- Sulphur / Magnesium
- Trace elements (Cu, Mn & Zn)

Management
- Deficiencies often more prevalent on lighter & sandier soil types
- Corrective options include; fertiliser compounds + S or TE's, - Mg-limestone, Foliar sprays, Seed dressings

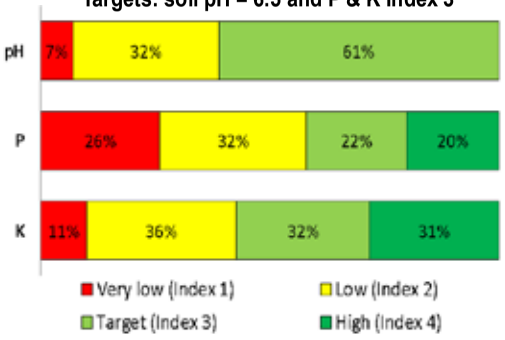
• Soil Organic Matter (SOM)

- Large source of plant nutrients stored in SOM
- Helps to maintain good soil structure and the retention of nutrients

Management
- Avoid doing cultivation with heavy machinery when soils are very wet
- Minimum SOM threshold 3.4% (2% Carbon) Cross compliance
- Crop rotations may help to preserve SOM and good soil quality

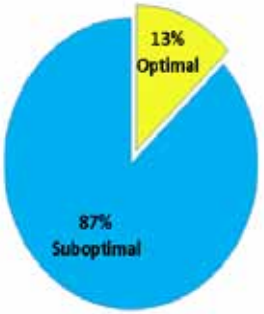
National Tillage Soil Fertility Status 2013

Targets: soil pH = 6.5 and P & K Index 3



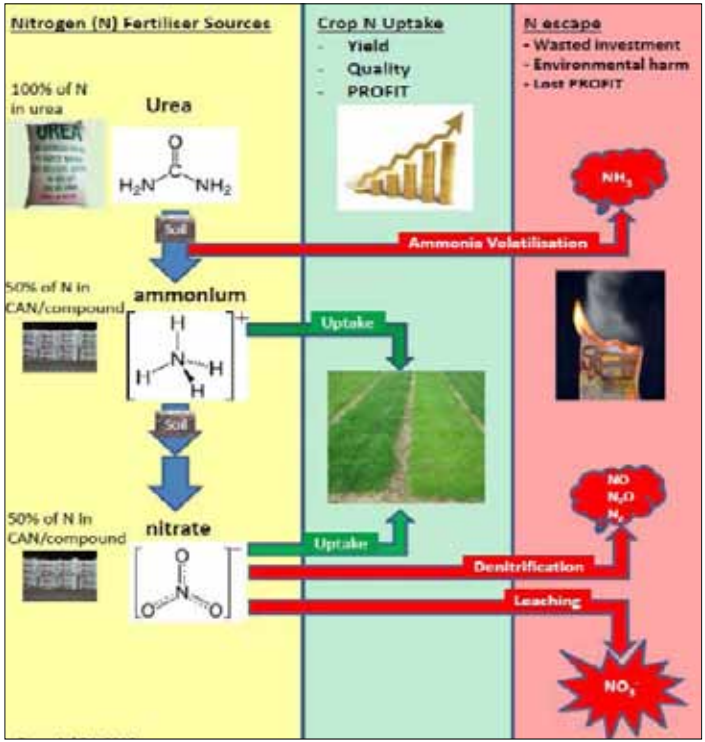
% Soils with Good Fertility

Soil pH >6.2; P & K Index 3 or 4



Nitrogen Fertiliser Formulations

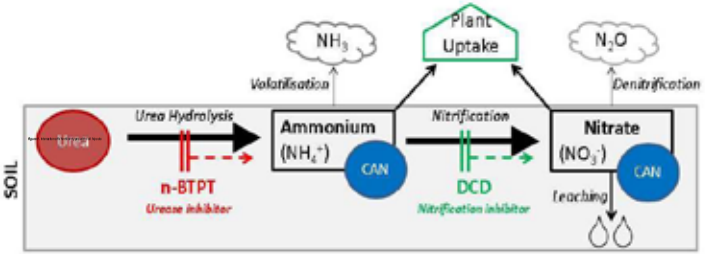
CELUP Johnstown Castle



Questions

- How does CAN (27%N) compare with Urea (46%N) for spring barley
- Are inhibitor technologies (added to Urea) effective in reducing N losses and increasing N fertiliser use efficiency

How do N inhibitors work?



Nitrogen Fertiliser Formulation Study

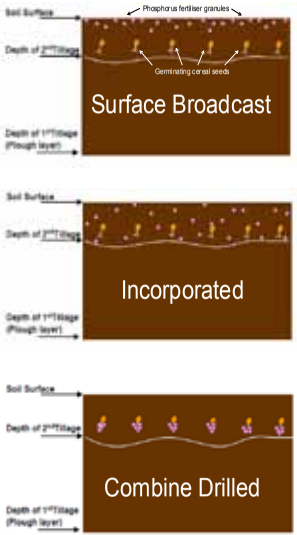
- Fertiliser N formulations evaluated
  (1) CAN (27%N), (2) Urea (46%N), (3)K$^{\alpha}$N *[Urea+Agrotain®]*
  (4) GEN *[Urea+Nutrisphere-N®]* (5) Zero N Control
- N Fertiliser rates (0, 80, 120, 160, 200 kg/ha N)
- Fertiliser applied in 2 splits
  - 1st Split: 30 kg/ha N at sowing
  - 2nd Split: remainder during early tillering (G.S. 22)

Phosphorus Fertiliser Studies

CELUP Johnstown Castle

P Application Methods

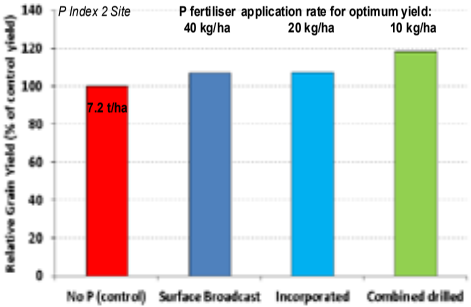
- Surface Broadcast after sowing
- Incorporated into seedbed
- Combine Drilled with seed (placed)



Crop response to P fertiliser

- Studies conducted in spring barley 2011-2014
- P application rates 0, 10, 20, 30, 40, 50, 60 kg/ha
  - Crop offtake @ 7.5 t/ha yield = 29kg/ha P
- P fertiliser types: TSP 16% & TSP+AVAIL®
- Three fertiliser application methods compared
- Range of soil types (P Index, Org Matter, Clay)

Effect of P fertiliser application method on grain yield and optimum P fertiliser rate

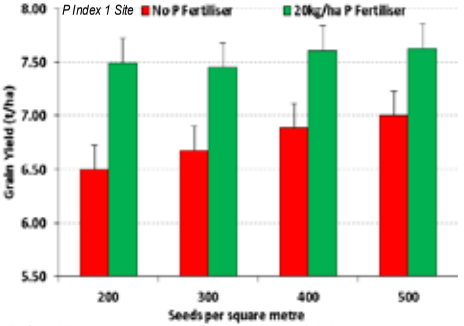


- Combine drilled P fertiliser was most efficient when soil test P levels were low (P Index 1 & 2)
- P Index 3 soils had higher yield potential.
- No differences between TSP16% +/- AVAIL®

Seeding rate and P fertiliser

- Barley seeding rates 200, 300, 400 & 500 seeds/m^2
- With and without 20 kg/ha P fertiliser applied

Effect of P fertiliser and seeding rate on grain yield



- P fertiliser essential for crop establishment
- Higher seeding rates required at low soil P levels
- 350 seeds/m^2 gives 1000 shoots/m^2 *(target shoot number)*
- Increased seed survival where P fertiliser applied

Spring Barley

Fungicide Trials - *Liz Glynn & Larry Murphy, Teagasc*

Teagasc
Agriculture and Food Development Authority

Spring Barley Disease Control

Disease progress
- Time of sowing
- Variety susceptibility
- Fungicide timing/rate
- Weather

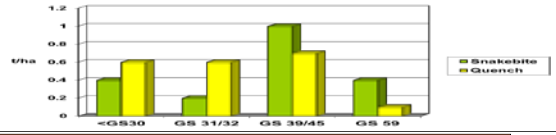
Why use Fungicides
- Maintain yield potential (tiller numbers)
- Disease Control (maintain potential yield)

Traditional Fungicide Programmes
-Two(2) applications (GS 30-31 + GS 59-ear out)
- Are crops losing potential from early disease?

Rhynchosporium

Disease levels dictate fungicide timing

Early disease will reduce yield (tillering to stem extension)
- by reducing tiller numbers
- **early intervention necessary!**



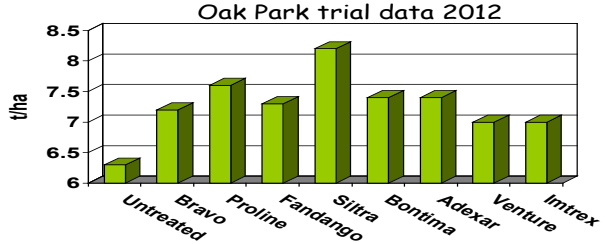
Action

1st application @ tillering- GS30
(at the onset of disease)
2nd application @ awns emerging
Adjust spend at each timing to reflect disease level

Teagasc
Agriculture and Food Development Authority

S. Barley Products

Oak Park trial data 2012



Fusarium Control
-More difficult to control than in wheat
-Flowering can start before head emergence
- Proline offers best control
Other diseases are important at this timing
- Early fungicides necessary (Ramularia, etc)
- GS 49 awns emerged (latest)

Key Messages
- Wide range of barley products available
- Avoid over using individual actives
- SDHI's add useful activity
- Avoid using straight products

Guidelines for Trading Cereal Crops for Forage Production

Siobhan Kavanagh, Teagasc

An expanding dairy industry will require more forage to sustain the national dairy herd. On many farms, forage production will be sufficient to meet herd demand. On highly stocked farms, buying in additional forage will be necessary. Buying in forage and coping with price volatility will present its own challenges on such farms.

The forage market is potentially a new opportunity for tillage farmers to supply quality cereal-based forages such as maize silage and whole crop cereal silage. It provides an alternative market outlet from the tillage farm and may be used as a management tool in crop rotation.

The key to a successful business relationship between the tillage farmer and the dairy farmer is transparency. By this we mean transparency in terms of:

- Measuring the yield of the crop;
- Evaluating the quality of the forage produced;
- Determining the value of the crop.

If entering an agreement on the growing and supply of cereal crops for forage production, a written agreement should be prepared. This will reduce ambiguity and issues arising at a later stage. The agreement should detail how yield will be estimated; how quality will be evaluated; and how the crop will be valued.

Guidelines for Trading Cereal Forage Crops

1. Written Agreement

- Prepare a written agreement detailing how quality and yield are estimated and how the crop is valued

2. Yield Estimation

- Buy/Sell the crop on the basis of yield, (NOT per acre)
- Weigh all trailers

3. Quality

- Analysis should include dry matter, energy & protein content
- Sampling procedure – when, how, who, where (lab), cost

4. Valuation of the Crop

- Agree a price per tonne DM based on the value of the forage relative to other feedstuffs on the market e.g. barley and soya bean meal

Valuation of the Crop

Feeds valued on an energy and protein basis

Relative to:

- Rolled barley @ €200 / t
- Soya bean meal @ €500 / t

Account for storage losses, ensiling costs & transport costs

	DM%	ME MJ	Crude Protein	Value € /t DM	Value € / t *
Forage maize 25% starch	32	11	8%	159	51
Whole crop wheat 25% starch	40	10.2	8%	150	60

* Assumes 15% losses

Sustainable Farm

Ger Shortle, Teagasc

The Agricultural Catchments Programme

Summary

- The Agricultural Catchments Programme is an essential part of Ireland's Nitrates and Water Framework Directive compliance and works in partnership with farmers.
- Average nitrate and phosphorus levels are generally low to moderate by international standards but improvement is needed to achieve water quality targets.
- Lag times of 5 to 20 years are expected between the implementation of the regulations at farm level and improvement in water quality.
- Farmers have an opportunity for a financial and environmental benefit ('win/win') if they can improve nutrient management on their farms.
- Effectively communicating the science behind the regulations to farmers should improve understanding of the benefits and uptake of measures.

Introduction

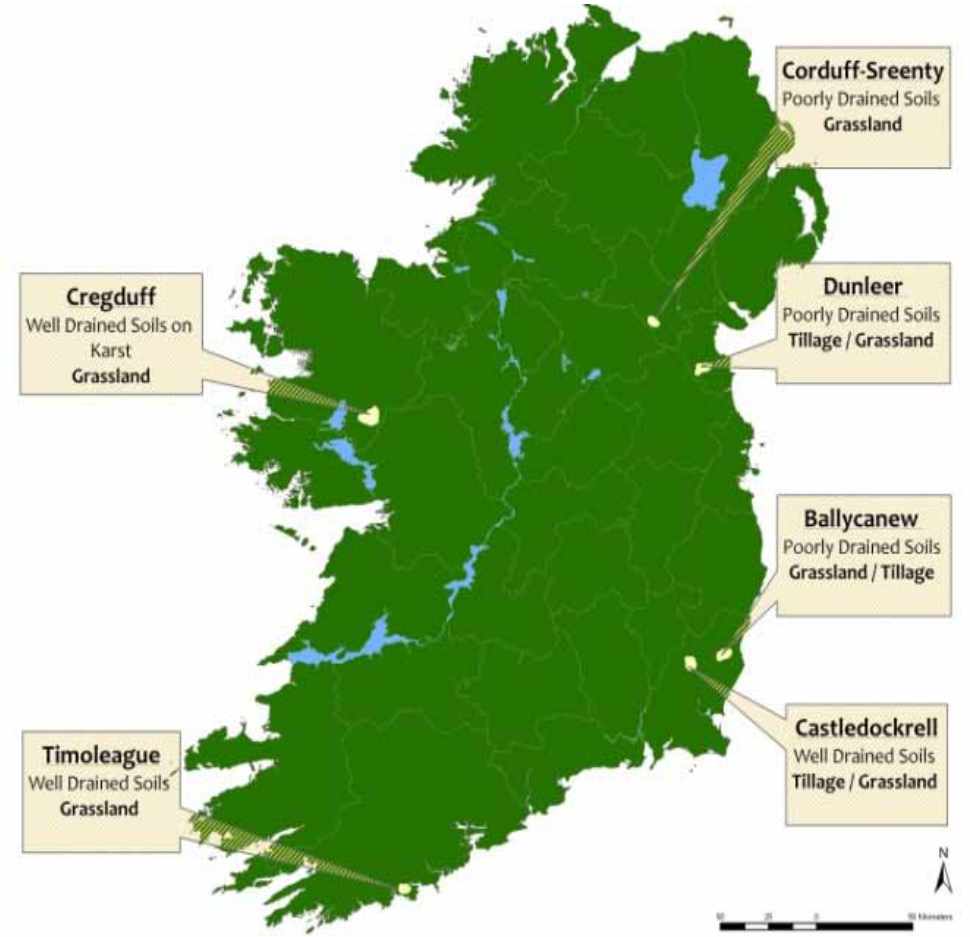
The Agricultural Catchments Programme (ACP) is an advisory/research programme working in partnership with farmers to help meet Ireland's water quality challenges.

The ACP was established to test the effectiveness of the Good Agricultural Practice (GAP) measures or 'Nitrates Regulations'. Measuring the effectiveness of Ireland's derogation,that allows farmers to stock land at up to 250kg or organic nitrogen per hectare is part of the ACP's work too.

ACP is also working to support Food Harvest 2020 aims to produce knowledge which enables farmers to grow output in a sustainable way and deliver both high quality food and a high quality environment. The scientific evidence produced by the ACP is also needed to support Irish agriculture in meeting the requirements of the Water Framework Directive (WFD). This 'umbrella' directive incorporates the Nitrates Directive and is focussed on achieving good ecological quality in all waters. It requires member states to have individual management plans for each river basin. There are eight river basins in the island of Ireland (seven wholly or partially in the republic). The next round of preparing new plans begins in 2015 and these plans can include additional farming measures to address specific local water quality issues.

Operating the Agricultural Catchments Programme

The ACP operates in six catchments (clearly defined areas drained by a stream or spring) where farming is the main land use. Each catchment was chosen to represent a specific combination of landscape, soils and farming. The map shows the location of the six catchments. They are all intensively farmed but vary greatly in the type of farming carried on in them. Two are predominantly tillage (Castledockerell and Dunleer) while the rest are almost completely grassland. The Timoleague catchment is dominated by dairying while the other grassland catchments have mix of beef, sheep and dairy farming.



There are over 300 farmers with land in the catchments and their support and co-operation is essential to the success of the programme.

We depend on the farmers for access to their land so that we can monitor soils, surface water, groundwater and the weather. We also gather essential information on how they farm and their economic performance. By building up this detailed information over many years can we learn how farming impacts on water quality and how the regulations impact on farming.

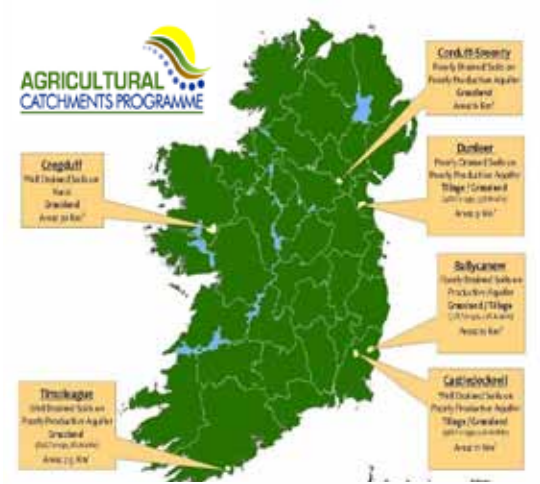
This knowledge enables us to help farmers improve their returns while reducing nutrients lost to water. The scientific approach taken by the ACP is the same in each catchment and is based on the concept that nutrients can only be delivered to water following a series of steps which begins with the sources of nutrients (soil, manure, fertilisers); if these are mobilised they must then follow a pathway before delivery to the water and only then may have an impact on water quality.

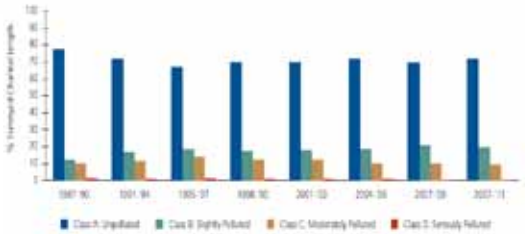
Each step must be completed for a water quality impact to happen and by improving our understanding of each step we can find ways to interrupt the process and reduce the risk to water from farming.

Summary of the main ACP findings to date

- Average nitrate levels in the streams and groundwater in all six catchments are well below the WHO drinking water limits.
- Phosphorus levels in the streams were low to moderate by international standards, however three had levels above the Irish environmental quality standard.
- There are some indications of recent water quality improvement, likely due to farmers adopting better management practices.
- Lag times of five to 20 years can be expected between changes in farm management and changing soil phosphorus and groundwater nitrate levels i.e. the GAP measures need time to work.
- There is scope to improve nutrient management on farms – this will produce a 'win-win' – better farm profitability and better water quality.
- Farm management practices need to be tailored to suit the soil types to be effective in reducing the risk of nutrient loss.
- There is growing acceptance of the environmental benefits of the GAP measures but scepticism remains around certain measures, especially, "calendar farming".
- Improved communication of the science underpinning the measures would help to improve farmers understanding of the rationale that they are based on.

More information at www.agcatchments.ie/agcatchments. The ACP is funded by the Department of Agriculture, Food and the Marine.

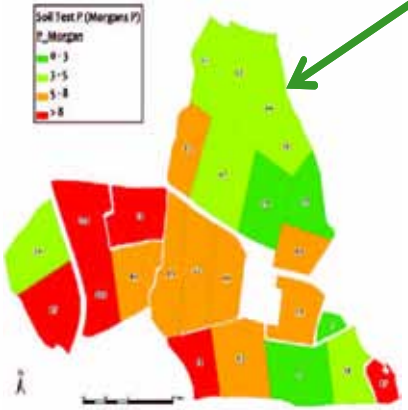




National Trends -Percentage of Surveyed River Channel in the Four EPA Biological Quality Classes (Source: EPA)

Sustainable Farming

- Clean water, good food, profitable
- Nitrates/Water Framework
  - Water quality targets set – 2015,2021...
  - Regulations reviewed regularly
- Aim - Win/Win – profits/water quality



What can I do? Better nutrient management

- Right time
- ✓ Growing season – better uptake, less lost
- Right place
- ✓ Follow soil test result – put it where it's needed
- Right product
- ✓ Match product to grass (crop) needs
- Right soil conditions
- ✓ Look after your soil

Kildalton 2030 - Sustainable Demonstration Farm

Ger Shortle, Teagasc

Food Harvest 2020 has given a new role to the concept of sustainability in agriculture. No longer are environmental issues considered an external constraint to Irish agriculture; instead, Food Harvest places sustainability at the very heart of the growth of the industry, as summarised by the tagline "Smart, Green, Growth", where "smart" refers to a vision of a knowledge-based industry, "green" refers to sustainability as a unique key-strength and selling point of Irish produce, and "growth" refers to the ambitious targets for the industry to grow over the next 7 years.

Irish agriculture has a unique opportunity to secure its future , a future that is sustainable in the widest sense of the word: economically, environmentally and socially. The future for the next generation of farmers looks promising, exciting, but also challenging. Can we meet the twin challenges of contributing to food security on the one hand, and maintenance of the world's natural resources at the same time? One thing is for certain: that the next generation of farmers will be working in a world that is profoundly different from the world we know today:

- The current CAP reforms signal a change in policy drivers that reward both the efficient production of food and the maintenance of our countryside;
- The finite nature of fossil fuel reserves will give a new role to energy security, both on farms, and in the wider society;
- The Water Framework Directive changes the emphasis of water protection from a rule-based approach towards a results-driven framework;
- The EU 2020 Biodiversity Strategy aims to halt biodiversity loss and the degradation of ecosystem services by 2020;
- Climate change will present a double challenge: 1) increasing pressure for agriculture to continue reducing its greenhouse gas emissions, and 2) increased weather volatility, necessitating more resilient farming systems.

Building on 15 years of research, we can be confident that solutions are available: we can draw on a rich experience from Teagasc research programmes at Curtin's Farm, Solohead Farm, Johnstown Castle, the National Farm Survey and our forestry unit.

The Kildalton 2030 Open Source Farm initiative will integrate these results into a system that is demonstrably sustainable, thus providing the scientific evidence underpinning the green credentials of our industry.

This initiative will assist in training the next generation of farmers in the concept and practical aspects of agricultural sustainability. It will provide a unique environment to evaluate emerging technologies in the context of an operational farm, and demonstrate how sustainability can be integrated into farming from field to supermarket shelf. The project will provide options for farmers to improve sustainability and an excellent example of collaboration in action – involving Teagasc, farmers and a range of other key stakeholders.

Teagasc
Agriculture and Food Development Authority

Sustainability Demonstration Farm

Leading sustainable growth in farming

Food Harvest 2020

- Smart - knowledge based
- Green - sustainable
- Growth - increased production

Transform Kildalton

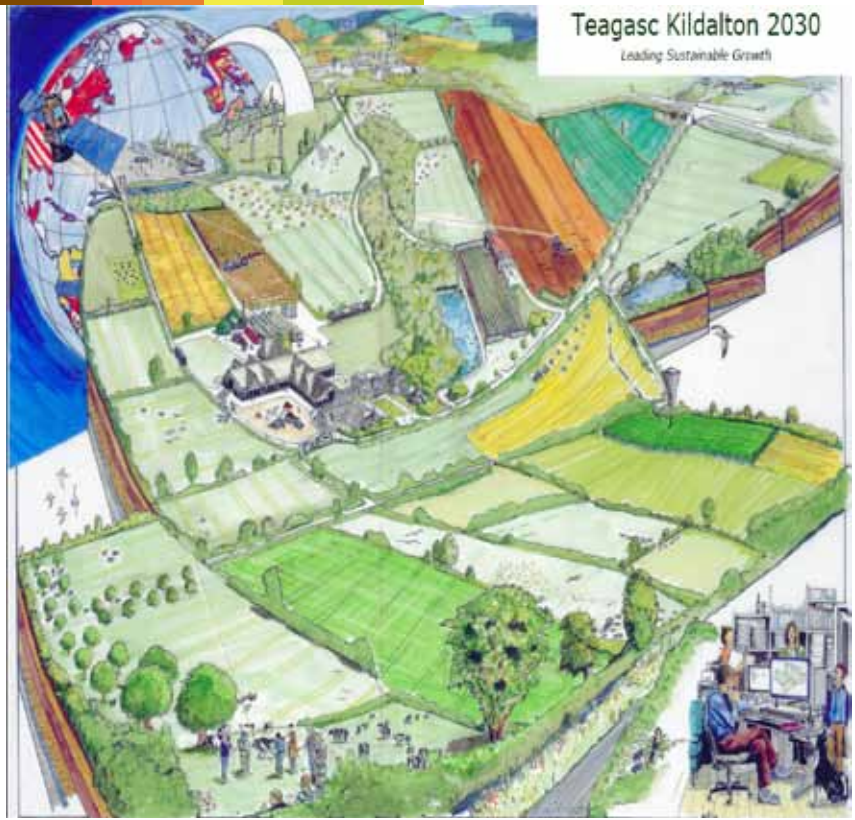
- Increased resilience
- Efficient use of resources
  - Nutrients, Energy, Water

Multifunctional farming

- Food, fuel, fibre

Ecosystem services

- Biodiversity,Carbon-offsetting, Water purification



Health & Safety

John McNamara, Teagasc

Health and Safety for Tillage Farms

A major increase in fatal farm accidents has occurred so far in 2014. By the end of May, 2013 farm deaths have taken place. This is a 70 % increase on past trends. Farm deaths cause tragedy, serious accidents cause pain and suffering and preventing accidents needs urgent attention.

Among the farm deaths so far in 2014, 8 were associated with a tractor, farm vehicles or machines, 3 were associated with livestock handling and a further 2 were due being crushed by falling objects. Accidents with tractors and machines were typically being struck or being crushed, so extra vigilance is necessary when vehicles or are been operated in the presence of bystanders.

To prevent further death and serious injury everyone involved in the farming sector needs to give safety first priority. Implementing safe behaviours and adopting sound controls and are crucial to preventing accidents. Gaining everyone's active and on-going involvement in accident prevention is the vital ingredient to improve the safety record of the sector.

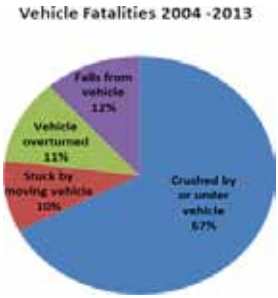
Conducting and updating a Risk Assessment for the farm is a legal requirement under the Safety, Health and Welfare at Work Act 2005. It is also the best practice for managing farm health and safety.

Health and Safety – ‘ Call for Action’

- Fatal Farm Accidents - 2014.
- 14 farm deaths (to June 23rd).
- 55% of all Work Place Deaths
- 2,000 Serious Injuries per year.
- Accidents cause
- Tragedy, Pain and Suffering.
- Disability
- Farm Income Loss

Safety with Farm Vehicles

- Associated with 27% of Farm Deaths
- Crush or being Struck the major cause.
- Pedestrians and passengers are most at Risk.
- Stop Dangerous Activities



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