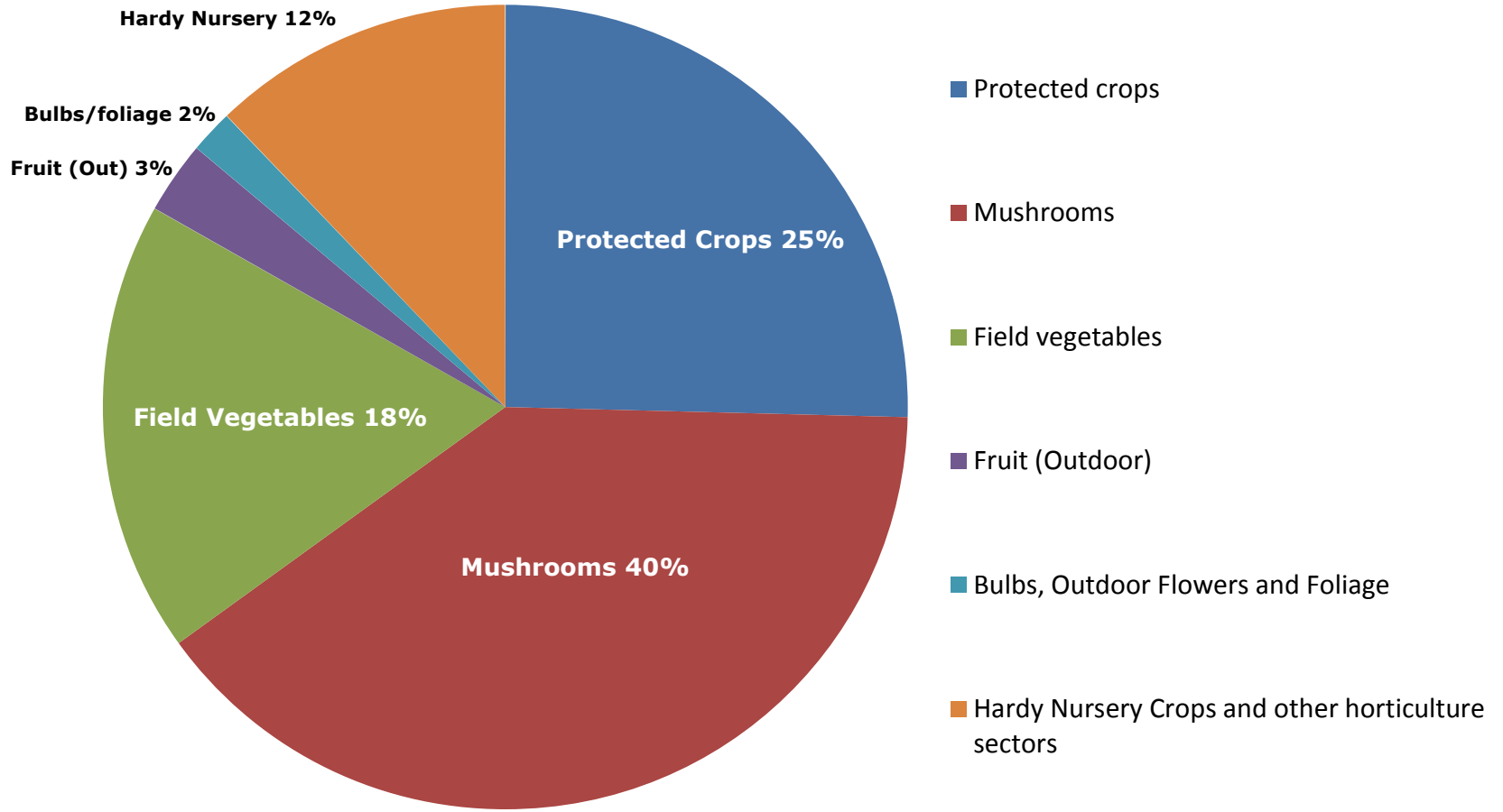




Horticulture Development Department (HDD)

Dermot Callaghan

Sector value distribution



Main Drivers of change

- Supermarket Multiples retailing 88% of fresh produce who have international volume purchasing arrangements
- Below cost selling driving out producers
- Consumer demands for safe food and sustainability in food chain- move towards whole foods and veganism (flexitarians)
- Aging demographic interested in health attributes of food and functional foods.
- Low uptake of Producer Organisation scheme (Brexit)
- Horticulture Industry Forum
- Aging primary producers, little succession planning
- DAFM Grant Scheme

High level Objectives

- Drive and Guide the expansion and development of the horticulture sector in Ireland, in consultation with stakeholders, so that it can achieve and optimise its potential.
- Facilitate near-market horticultural research, development and associated technology transfer through an integrated horticultural research, advisory and educational programme.

Sector specific objectives- e.g. Mushrooms

- Peat replacement.
- Increasing compost utilisation (mushroom industry)
- Spent mushroom substrate - a valuable by product (circular economy)
- Mushrooms – a source of health beneficial compounds
- Integrated Pest Management (IPM) (New pests)
- Food Safety and risk assessment
- Labour saving

Sector specific objectives – e.g

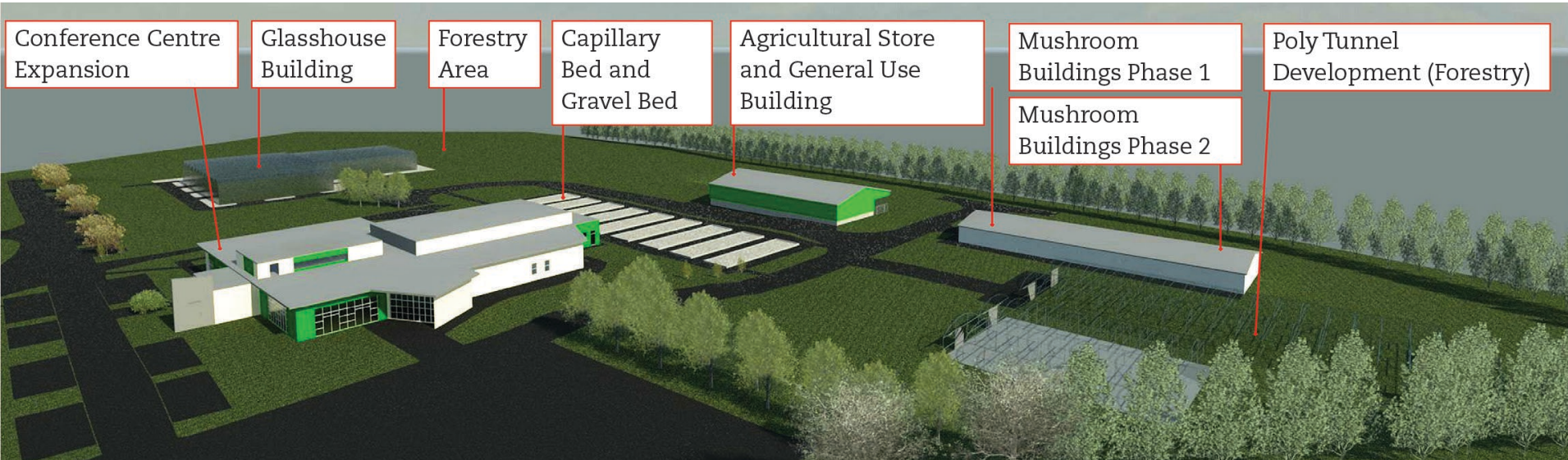
Foliage

- Three thematic areas of applied research & development are identified
- **Plant Screening** – to identify a range of ‘newer’ and innovative plant types to continuously excite an expanding market.
- **Agronomy systems** - to improve efficiencies in terms of yield and quality of selected lines (including native woodland species). IPM for quality and environmental consideration
- **Adding value and new product development** –to increase the diversity of end use.

HDD Structure / Resources

- The research programme is based primarily in Ashtown Dublin with some extension trials in other areas including Kildalton College in Kilkenny.
- The advisory programme is regionally based.
- There are currently 12 permanent staff in the Department: 5 specialist advisers, 2 researchers, 2 technicians, 1 Technologist and 1.5 FTE farm staff.

Ashtown Facilities



Structure

Research:

- Mushrooms (Dr Helen Grogan)
- IPM and other horticultural research (Dr Michael Gaffney).



Knowledge Transfer:

- Mushrooms (Donal Gernon)
- Vegetables (Stephen Alexander)
- Soft Fruit (Eamonn Kehoe)
- Cut Foliage & Veg (Andy Whelton)
- Nursery stock and ornamentals (Donall Flanagan)
- Protected Crops. (??)
- Horticulture engineer (??)

Technical:

Leo Finn and Irene Marongiu (Technician)

Brian McGuinness (Pathology, H&S)

Additional Contract staff depending on external funding. Teagasc Research Staff in Ashtown and also Walsh Fellows depending on funding.

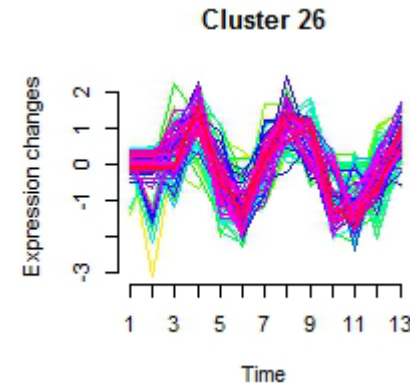
Mushroom Research Program

- AgGenes (14 S 865) 2015-2018
- SafeMush (14 F 881) 2014-2019
- *Agaricus* Genomics (WF 2015014) 2015-2019
- Lignocellulose (WF 2017020) 2017-2021

Mushrooms: Recent Key Outputs

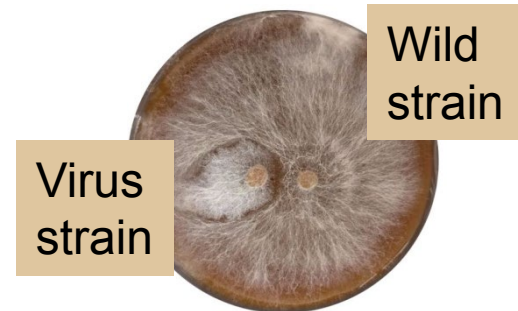
AgGenes (14 S 865)

- Analysis of gene clusters associated with compost utilisation now completed
- Proteomic analysis of compost over course of a crop near completion
- State of the Worlds Fungi Conference (Poster)



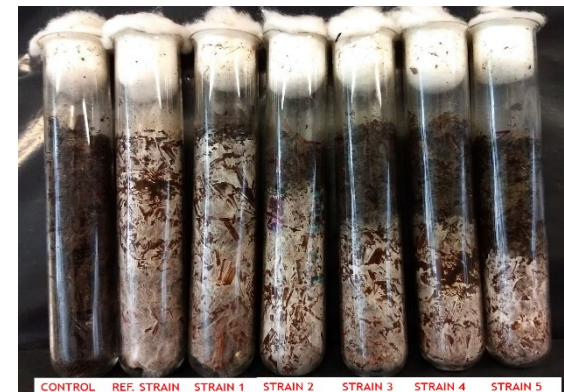
Agaricus Genomics (WF 2015014)

- Genome assembly of a wild *Agaricus* strain started
- Transmission of viruses into 5 strains completed
- Proteomic and transcriptomic response of *Agaricus* to (a) anastomosis and (b) virus infection is in progress



Lignocellulose (WF 2017020)

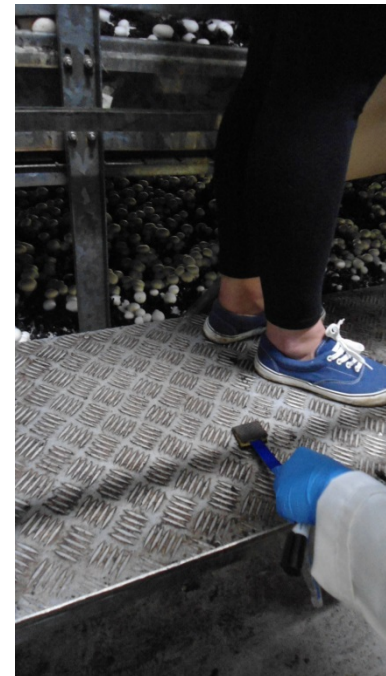
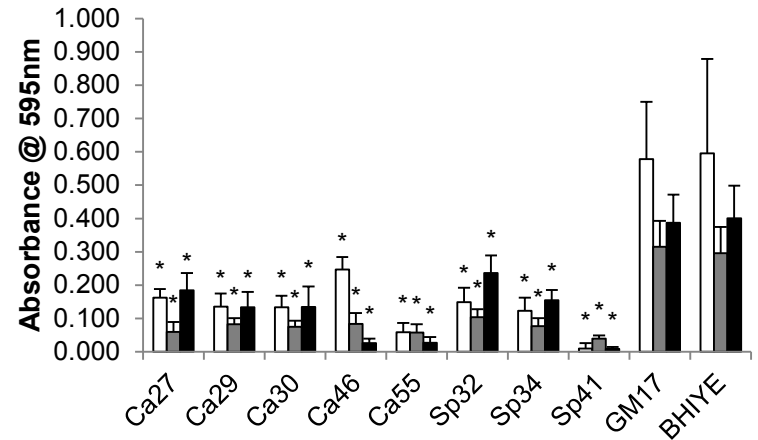
- Characterization of phase 2 compost for ligno/cellulose composition and standardization of existing protocols has started
- Lignocellulose degradation by novel variant strains started



Mushrooms: Recent Key Outputs

SafeMush (14 F 881)

- Anti-listerial bacteria and bacteriocins identified
- Anti-listerial phages identified
- Training video for industry in preparation
- Two papers submitted for publication



Advisory Key Outputs / Activities

- Farm walk for Brown Mushroom Growers focusing on agronomy and maximising yield.
- Pesticide Training Workshop held for mushroom growers and the industry providing updates on approved products, application methods, IPM and audit requirements.
- Bi-Monthly Mushroom technical newsletters provided to the industry providing insight into agronomy issues, labour permits, SSRH scheme, Pesticide products and grants
- Provided reports for the industry e.g regarding the straw supply crisis - *'The impact of straw shortages in the Irish mushroom industry 2018'*



***Brown Growers Farm Walk Held
on M & G Mushrooms on
30/08/18***

Key deliverables

- **Provide intensive technical support to growers converting their farm from Phase 2 to Phase 3 Mushroom production – Infrastructural advice, financial feasibility analysis, production planning and growing advice**
- **Mushroom industry Lean Programme:**
 - Conducted 15 Farm Assessments – Assessing Farm Infrastructure, Agronomy, Harvesting, People management, IT infrastructure & Energy.
- **Organised 5 Continuous Improvement Seminars:**
 - Agronomy/best practices
 - People Management
 - Supervisor Development
 - Recruitment and Retention



Integrated Pest Management Research in Horticulture

1. **StopSpot:** Non-chemical control options for Spotted Wing Drosophila management in Fruit Crops (0158) (WF)
2. **National Spotted Wing Drosophila Programme 2018** (0776) (Bord Bia / Industry Funded)
3. **MushFly:** Improved Management of fly pest in commercial mushroom production (0162) (WF)
4. **FlyIPM:** Integrated control of root feeding larvae infesting vegetable crops (0336) (CIPM)
5. **New Leaves:** Epidemiology and Control of Insect pests of foliage crops (0246) (Stimulus)

Industry Challenges:

1. Design control systems for SWD less reliant on the use of synthetic insecticides
2. Re-define the insect pest complex on Irish mushroom farms. Establish the mechanisms of declining efficacy of current control systems
3. Improve the use of biological control products at outdoor temperatures for use in soil
4. Identify the major pests of foliage crops and develop control approaches to minimise crop damage

SWD project outputs

Key Outputs:

- Monitoring dataset from first identification in 2015 to present day
- Monitoring programme has informed 17 farms of the presence of SWD at a very early stage, allowing them to establish best management practice to minimise crop damage / Financial loss
- Two training courses have been developed, with 80 industry professionals completing the Level 1 course and 20 completing the Level 2 course to date

Impact:

- Coordinated approach to management of this issue has resulted in no major marketing issues due to adverse publicity
- Monitoring data has been used to secure 9 Emergency Field of Use for additional pesticides since 2016

Leafy Field Vegetable Cadmium Survey (0556)

- **CREDIT:** Cadmium and other Heavy Metals - Detection and Mitigation in Horticultural Produce, Soils and other Crops **(0435)**
- **Key Outputs:** While the Leafy Veg Survey has just commenced it has already confirmed research from a previous project that salad leaves (Spinach, Beet species, etc) display a high propensity to uptake cadmium at high and very high levels. This information has been relayed to growers and appropriate mitigation strategies are being evaluated.
- **Background:** CREDIT is a newly funded project, leading on from a recently finished project CdRed. Credit will look to further develop and refine models developed in the previous project while also advancing fundamental knowledge of soil kinetics as it pertains to cadmium, and developing rapid hand held measurement / diagnostic devices.

Integrated Pest Management – Monitoring for Established Pests

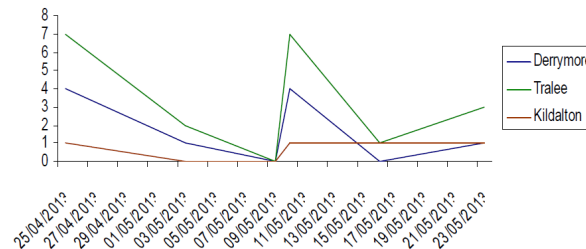
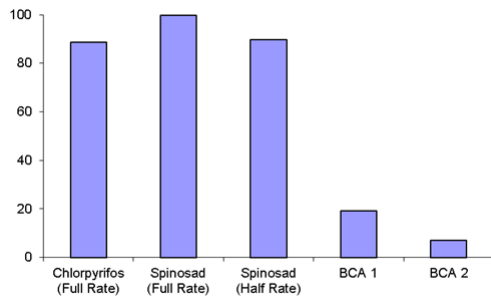
(1) Cabbage & Carrot Root Flies
(*Delia* sp.)



(2) Capsid & Thrip
sp. in Foliage



(3) Black Vine Weevil



Nursery Stock and ornamental plant sector

- Key Outputs / Activities
 - Industry tours & meetings
 - » Flanders July
 - » AHDB visits Jan & June with clients
 - » Sector meetings on nurseries
 - » Annual industry seminars
 - Monthly E Bulletin reaching 250+
 - » Relaying latest info on Plant health and technical production to growers and producers
- Recent Impacts
 - Irrigation and water management
 - Technical advice on novel pests and diseases
 - Technology adoption

Advisory and applied research





The Irish Cut Foliage Industry

- **200 Ha – 12 million stems**
- **25 Growers**
- **Value – €6m**
- **Employment - 40 FT 150 PT**
- **Species**
 - Cultivated (*Eucalyptus*, *Pittosporum*, *Prunus*)
 - Wild (*Rhododendron*, *Noble fir*)
- **Features** – Quality, Environmental issues & Innovation
- **Products** – commodity stems, added value bouquet products, arrangements, garlands, painted/glittered foliages
- **Markets**
 - home & export - supermarket packers (60%)
 - UK & Dutch wholesale (25%)
 - On - Line Platforms (15% & increasing)
- **R&D** – ‘New Leaves’ stimulus project, Agronomy & Species screening
- **Cut Foliage Group** – Teagasc, DAFM, Bord Bia, EI & Industry

A. Whelton

andywhelton@teagasc.ie



Others: Recent Key Outputs:

New Leaves (15 S 759) - Cut Foliage Research

- New varieties of *Eucalyptus* have been selected for growth trials
- Irradiated Eucalyptus seed have been outplanted to monitor for novel variants
- Micropropagation methodologies have been identified for *Eucalyptus* spp.
- *Microproaagtion* and polyploidy work is underway for *Pittosporum*, *Viburnum*, and *Brachyglottis greyi*



Other: Recent Key Outputs:

New Leaves (15 S 759) - Cut Foliage Research

- Industry survey of shot hole disease has identified disease-prone locations and conditions
- No *Xanthomonas arboricola* var. *pruni* (a new plant health) has been detected to date
- Cultivar studies and defence gene analysis has identified *P. laurocerasus* var. *caucasica* displaying the lowest symptom severity
- Industry monitoring of insect pests (capsids, thrips, moths) and their epidemiology is underway



Fruit



cv. 'Malling Centenary' Nutrition trial



Eamon Kéloe
Horticulture Development Department
Ailltoinn Research Centre

- Huge growth in the soft fruit sector over the last 20 years.
- 'Elsanta' has dominated the market for almost 40 years.
- The new cultivar 'Malling Centenary (East Malling Research) shows huge promise
- Establishing production plans for the Industry

This experiment

- Crop is grown in coir (cocoa peat)
- Planted in January in heated env.
- Nutrition for crop unclear
- Two nutrition treatments



Potential impacts

- Get better understanding of the morphology & behaviour of this short day (SD) plant
- Establish growing protocols for the growers
- Invite growers and students to visit the unit
- Diffusion of knowledge and spill over!



Thank You

Questions?