Horticulture Education Leadership Group

Submission to the Leaving Certificate Draft Agricultural Science Curriculum

March 2026

Introduction

While the principles of the current and former agricultural science curricula seek to explore and understand the sciences behind agriculture the subsequent overarching focus of the curriculum is on animal production and animal feed with a very limited exploration of plant production for food, clothing, medicine, shelter, environmental impacts and social benefits. This limited scope serves to significantly undervalue agricultures' contribution to society and the economy (food, environment and tourism) in Ireland (and globally). Except for a single mention of the word horticulture on page 4 and the potato (potatoes are defined as a horticulture crop in the An Bord Glas Act, 22 of 1994) as a food crop, the contribution that the horticulture industry makes is absent. Horticulture is the 4th largest sector in agriculture after dairy, beef and pigs in terms of gross agricultural commodity output value.

Absent are the horticulture crops (many of which use advanced technologies in their production) such as in Protected crops: Mushrooms (Ireland has the one of the largest integrated mushroom companies in the World, Monaghan Mushrooms), tomatoes, strawberries, cucumbers, sweet peppers, lettuce, salads leaves, herbs and flower crops. Fruit crops such as apples, outdoor strawberries, raspberries, currants and blueberries. Field Vegetable crops: potatoes, carrots, parsnips, cabbages, swede, kale, cauliflower and broccoli to name just a few. Nursery stock plants for environmental use in urban landscapes and urban greening and sports turf critical to GAA games, soccer, rugby and horse racing are also not mentioned. Also absent is horticulture's contribution to social and therapeutic services, biodiversity and environmental protection through landscape design and planning, habitat protection, conservation and ecological restoration/ conservation horticulture, botanic gardens plant conservation initiatives, and amenity plant production all of which are vital for human health and wellbeing.

While there are considerable common technologies that are used both in agriculture and horticulture there are, however, specific technologies which are used only in horticulture. For example, micropropagation and tissue culture for the propagation of and protection of plants, vegetative propagation (including various grafting techniques for disease prevention), advanced environmental controls in protected horticulture, and precision cultivation in field vegetable crops. And unique processing technologies for horticulture derived food and drink products.

The virtual exclusion of horticulture in this curriculum ignores the significant contribution that horticulture has and will continue to have in relation to climate change mitigation both in urban, peri-urban and rural areas through nature-based solutions for flooding and carbon uptake. Not to mention the role horticulture can and is playing in fulfilling nature restoration aims along with other environmental obligations in national and international policy such as supporting sustainable harvesting of wild resources. Plants and plant-based products are a critical essential component for a healthy human diet.

There is no holistic definition of the term agriculture (please see below) to include horticulture and forestry in the document. Currently the proposed curriculum perpetuates the animal centric

view of agriculture in Ireland. Explicit and meaningful integration of horticulture within the Agricultural Science specification would ensure the curriculum reflects the full scope of Irish agriculture, supports national climate and biodiversity objectives, and would broaden pathways into a high-skill, technology-driven and economically significant sector.

A proposed definition of the term Agriculture is as follows:

Agriculture is *the applied science and system of practices involved in cultivating soils, producing crops, managing forests, and raising animals to provide food, raw materials, and essential ecosystem services. It encompasses the full spectrum of plant- and land-based production systems, including* ***horticulture****—the intensive cultivation of fruits, vegetables, ornamental plants, and specialty crops—and* ***forestry****—the sustainable management, conservation, and utilisation of forests and woodland resources. Within a curriculum context, agriculture integrates scientific knowledge, technical skills, environmental stewardship, and socio-economic understanding to prepare learners for responsible and sustainable engagement with natural and managed ecosystems.*

Review of the draft *Leaving Certificate Agricultural Science Specification*

Highlighted below are all the natural points where horticulture could be explicitly added, strengthened, or integrated into the curriculum, showing (1) where horticulture naturally aligns with existing content and (2) where explicit additions would enhance balance between agriculture and horticulture.

---

1. Rationale Section (pp. 2–3)

Why add?
The rationale frames Agricultural Science as focused on the natural world, sustainability, food systems, land use, and human wellbeing — all of which match horticulture activities such as food crops, amenity/environmental horticulture, landscape management, and ecosystem services.

Suggested additions:

- Explicit mention of *horticultural crops* and *horticultural systems* as part of agriculture.
- Reference to horticulture's role in biodiversity, climate mitigation, landscape design and management, and food security beyond field crops.

---

2. Aims (p. 3)

The aims currently emphasise "modern agriculture" but omit horticulture (and Forestry) by name. Horticulture employs the most advanced cultivation and harvest technologies.

Where horticulture fits:

- Develop knowledge of *plant production systems* (arable and horticultural crops could be explicitly mentioned).
- Apply inquiry skills to *diverse plant production systems* including horticulture crops both in field, orchard and protected environments.

---

3. Beyond Senior Cycle (p. 4–5)

This section lists horticulture-related careers but does not explicitly indicate how the course prepares students for them.

Suggested addition:

- Highlight that students gain foundational skills relevant to production horticulture, environmental/amenity horticulture, landscape/habitat management, and the wider plant sector.

---

4. Key Competencies (pp. 6–11)

Horticulture aligns strongly with:

- Creativity and problem-solving
- Participating in society (community gardens, urban greening, sustainable food systems, social and therapeutic horticulture)
- Cultivating wellbeing (links between green spaces, mental health, ecosystems, clean air and water)

Where to reinforce horticulture:

- Include horticultural contexts (e.g., plant propagation techniques, horticultural enterprises, urban horticulture/agriculture and floriculture) as examples of inquiry, modelling, communication, sustainability.
- Highlight the sciences underpinning design and its application to commercial and residential landscape spaces.

---

5. Strand 1: Soils (pp. 15–22)

Soils underpin horticulture as much as agriculture. In addition to soils there are other growing media used in horticulture for example composted materials, peat free growing media, hydrogels, inorganic materials and water systems/hydroponics/Nutrient Film Technique (NFT).

Additions or examples could include:

- Soil/growing media management for vegetable crops, fruit production, protected crops. Include composting technologies for growing media development and sustainable use of organic materials.
- Organic matter examples including compost use, green waste, mulching in horticulture.
- Soil microbiome and rhizosphere — strong links with horticultural practice (field crops, nurseries, polytunnels, glasshouse soils).

---

6. Strand 2: Plants (pp. 21–29)

This is the primary location where horticulture is naturally aligned but currently absent.

Key opportunities:

Crop Identification List

The course lists agricultural crops but omits:

- Mushrooms
- horticultural vegetables (carrots, onions, brassicas, salads)
- fruit crops (apples, berries)
- protected crops (tomatoes, cucumbers, peppers)
- ornamentals (trees, shrubs, herbaceous plants, flowers, pot plants)

Plant Physiology

This applies equally to horticulture — the following could be highlighted:

- propagation (cuttings, grafting, tissue culture)
- vegetative vs generative growth
- plant training and pruning (hormone systems)
- Plant nutrition

Land Use & Crop Production

Add horticulture-specific:

- crop rotation including vegetable sequences
- organic horticulture

- polytunnel/glasshouse management
- integrated pest management for protected and field crops
- plant nursery production systems
- floriculture (cut flower, cut foliage and pot plant production).

Grassland Section

A subsection on *horticultural cropping systems* (field vegetables and orchard management, for example) would balance the curriculum. Also, the inclusion of horticulture sports turf production is highly relevant. It should be noted that in grassland management refractometers are used to measure the sugar content of grass. Similarly, in horticulture these are used to measure sugar content in fruits- a cross-cutting use of technologies.

---

7. Strand 3: Animals (pp. 28–37)

Horticulture does not fit here directly, but:

Integrative opportunities:

- Pollinators (essential to horticultural crops)
- Biological pest control using beneficial insects
- Soil–animal–plant interactions relevant to diversified farms, in particular organic farms.

These could be introduced under:

- **3.3 Animal nutrition and health** (ecosystem services)
- **3.7 Agricultural engagement** (mixed enterprises including horticulture, urban agriculture)

---

8. Cross-Cutting Themes (p. 10–12)

Horticulture strongly aligns with all themes:

Sustainability

- peat alternatives for plant growing media
- advanced composting technologies for agricultural and industrial by-products (the circular economy, exemplified by mushroom production)
- urban greening and urban heat island mitigation
- pollinator-friendly planting
- pollinator corridors
- carbon sequestration via amenity trees, hedgerows, forestry and perennial systems

- food security
- plant protection
- rain and greywater collection and use
- invasive species management
- crop wild relatives
- plant health

Health & Safety

- pesticide certification, risk assessment, residue analysis.
- horticultural machinery
- ergonomics in glasshouses and other protected structures

Food Production

- fruits and vegetables
- protected fruit and salad crops
- controlled environment agriculture (CEA)

Technology

- hydroponics/aeroponics/aquaponics and vertical farming
- precision horticulture
- climate/environmental controls in glasshouses

Supply Chain

- Develop understanding of how horticultural crops move from field or protected production systems through harvesting, grading, storage, transport and retail.
- Understanding the scientific and logistical processes that underpin freshness, shelf-life, food quality assurance and food safety.
- Opportunity to examine the environmental footprint of different supply chain models (local, national and imported produce).

These could be explicitly referenced.

---

9. Agricultural Science in Practice Investigation (pp. 39–43)

Secondary Schools are far more likely to have access to small scale polytunnels or growing areas than to agricultural land. This is an ideal space to explicitly state that students may carry out investigations in **horticulture**, such as:

- comparing seed varieties of vegetables

- yield measurements for polytunnel crops or pot plant trials.
- Growing media and compost trials
- pest management evaluations in horticultural settings
- modelling pest and future climates

This helps legitimise horticulture as a valued investigative domain.

---

10. Teaching for Student Learning (p. 38–39)

The document mentions:

- “green spaces”
- “polytunnels”
- “growing areas”

These are horticultural spaces, and could be expanded to include:

- Glasshouses
- Field scale nurseries (trees and shrubs)
- Field and vegetable producers
- school gardens
- urban agriculture (a link between agriculture and horticulture) connecting food growing and animal husbandry at a micro/small scale and includes city farms, community gardens and allotments.
- tree and shrub areas
- sensory gardens
- plant nursery production units

Explicit naming strengthens horticulture’s presence.

Feasibility and Practical Implementation

Horticultural practical work and experimentation can be delivered using affordable, reusable propagation equipment that is readily scalable within school settings. Most activities require minimal infrastructure, and plant growth, yield and performance can be assessed using standard laboratory equipment and widely available materials. In addition, continuing professional development (CPD) for teachers delivering horticultural components could be readily facilitated, as many core plant science principles build directly on existing biology knowledge and can be supported through short, practical upskilling programmes.

Broadening Access and Participation in Agricultural Science

DEIS and/or Urban Schools

Greater integration of horticulture within the Agricultural Science curriculum would broaden access to the subject across a wider demographic of schools and learners. In many urban and suburban contexts, particularly in schools without direct links to livestock farming, horticulture offers a more feasible and relevant entry point into land-based education. School gardens, raised beds, polytunnels and small-scale growing projects are more adaptable to constrained sites and diverse school settings. By embedding horticulture more explicitly, the subject becomes accessible to students who may not traditionally identify with agriculture, thereby widening participation and introducing new cohorts to plant science, environmental stewardship and land-based careers.

Contributing to Gender Balance

Greater integration of horticulture within the specification may contribute to improved gender balance and increased participation by broadening the perceived scope of Agricultural Science. Research in STEM and land-based education consistently indicates that curricula which visibly incorporate sustainability, plant science and environmental systems tend to engage a more diverse range of learners. By embedding horticultural systems, including food crop production, biodiversity-focused planting and climate-resilient growing systems, the subject presents multiple pathways of relevance and engagement.

Reflecting a Multicultural Ireland in Agricultural Science

Integrating horticulture more explicitly within Agricultural Science also reflects Ireland's increasingly multicultural society and the global nature of contemporary food systems. Many students bring lived experience and cultural knowledge of diverse crops, growing systems and food traditions from across Europe, Africa, Asia and the Americas. Recognising and valuing these perspectives within the curriculum not only strengthens inclusivity but also provides rich opportunities to explore global food production systems, climate adaptation strategies and crop resilience in different environments. Through horticulture, students can examine how communities respond to water scarcity, soil limitations, temperature extremes and food security challenges worldwide. This deepens scientific understanding while fostering global awareness of climate change, food resilience and sustainable land use.

Summary: Where Horticulture Can Be Added

Here are the 10 key areas:

1. **Rationale** — include horticulture as part of agriculture.
2. **Aims** — reference horticultural systems.

3. **Beyond Senior Cycle** — connect clearly to horticultural careers.
4. **Key Competencies** — add horticulture examples.
5. **Strand 1 (Soils)** — add horticulture examples and contexts.
6. **Strand 2 (Plants)** — the biggest gap; add horticultural crops, systems, and practices.
7. **Strand 3 (Animals)** — link via ecosystem services/pollinators.
8. **Cross-Cutting Themes** — horticulture is strongly aligned; include explicitly.
9. **Assessment (Practice Investigation)** — specify horticultural investigations as valid.
10. **Teaching for Student Learning** — explicitly reference horticulture learning spaces.

Conclusions

The explicit integration of horticulture within the Agricultural Science curriculum would significantly enhance its relevance to contemporary society and the Irish economy. It would provide a more balanced representation of modern agricultural practice, strengthen understanding of food systems, climate resilience and sustainability, and broaden awareness of land-based career pathways. The inclusion of horticulture aligns with healthy diets-healthy eating and cross links with other Leaving Certificate subjects most notably, Biology and Home Economics.

Embedding horticulture would also support wider participation across diverse school contexts, while remaining practical and feasible to deliver through accessible resources and targeted CPD for teachers. In doing so, the curriculum would better reflect the full scope of agriculture and prepare students for an evolving, technology-driven and environmentally critical sector.