Clonally Propagated Fruit and England's Precision Breeding Framework

Beyond GM, November 2026

In June 2026, the High Court ruled that the regulations governing gene-edited crops and food in England were unlawful, in response to a judicial review brought by Beyond GM. Five months later, those regulations are still operating. In the meantime, the government has approved more experimental plantings of gene-edited crops and issued marketing notices, the first step towards food authorisation, for gene-edited strawberries and bananas.

The court found that the farming minister had been wrongly advised that he had no power to make gene-edited products transparent through the food system. Not understanding his powers, he did not ask the questions a change of this scale required. In pressing ahead without a full understanding of the regulations' impacts, the court said, the government had "prioritised commercial interests over concerns raised about the impact on the organic sector, consumers and trade within the UK and EU." The remedy has yet to be decided.

That ruling exposed one failure in a regime built on two flawed and unproven premises: that gene editing is simply an extension of traditional breeding and produces equivalent products and that gene-edited products are safe for the environment and for people to eat. The Genetic Technology (Precision Breeding) Act 2023 treats both as settled.

The regulations made under it remove checks that apply to other genetically modified organisms, including environmental and safety assessments and traceability through the food system. In their place, the regime relies largely on developers certifying the safety, stability and appropriateness of their own gene-edited crops and foods. It was poorly conceived and hastily pushed through Parliament, with little grasp of how interconnected the food system is. As a result, inconsistencies and gaps run right through it.

Skip to section:

What is clonally propagated fruit?

Regulating conventional fruit propagating material

What about precision bred fruits?

Two products, different routes to market

Government inaction on PBO fruits creates uncertainty

Unresolved questions

Annex 1 Case Study: Grapevines and varietal identity – another gap

Gene-edited fruit shows those gaps especially clearly. The regime was designed largely with annual agricultural crops in mind, such as wheat, barley, soya and oilseed rape. Fruit has a separate regulatory system. Strawberries, bananas, apples and cherries are normally multiplied as clones, from runners, suckers, grafts or lab-grown plantlets, rather than from seed and so bypass the seed regulations entirely. Gene editing adds an earlier step. Cells are edited in the laboratory and regenerated into a whole plant, which then becomes the source of every plant that follows. Whatever changed in that single plant, intended or not, is carried into all of them.

Defra has recognised the need for legislation addressing precision-bred fruit, but the public record does not yet explain how the two sets of rules fit together. Confirming that a plant is a precision bred organism (PBO) is not enough. Nurseries, growers and organic certifiers also need to know whether its planting material can be marketed, how it is identified and what information must follow it through the supply chain. There is also a more fundamental question: When a familiar fruit variety is gene edited, in what sense does it remain the same variety and who decides this?

This briefing sets out how fruit is regulated, why clonal propagation is important and the questions England's framework leaves open about assessment, identity and traceability.

Key findings

- Strawberries and bananas are among the first fruits to receive precision breeding marketing notices, yet none of the UK's fruit marketing regulations has been amended to recognise PBOs.
- Once a PBO fruit variety enters the fruit marketing system, nothing on variety registers, labels or supplier documents identifies it as gene edited.
- Clonal propagation means any unintended change in the first edited plant is carried into every plant that follows and cannot be bred out without losing the variety.
- Simplot reports checking only one potential off-target site in its strawberries, despite both the original and edited plants being available to test.
- Tropic sequenced both the original and the edited banana but did not compare them. ACRE accepted evidence from a study of rice instead.
- An edited Cox could keep its name with nothing to show it has been edited, or be registered under a new one. No one has said who decides.
- The EU's new rules link edited origin to planting material. England's do not.
- Food approvals are advancing before these planting-material questions are answered.

What is clonally propagated fruit?

New fruit varieties often begin with sexual crossing and the selection of a promising seedling. Once selected, the plant is then copied vegetatively – or clonally. Clonal propagation maintains the chosen variety; it does not mean that the variety itself originated without any sexual reproduction. Most modern fruit cultivars are created by crossing two known parents, though many heritage varieties, including Cox and Bramley, began as chance seedlings long ago.

While some plants breed "true-to-seed", others do not. Individual apple trees, for instance, have a wildly mixed, diverse set of genes from two different parents. Plant 10 pips from a single Cox apple and you will get 10 completely different apple tree varieties – none of which will taste like a Cox.

To keep a variety “true,” therefore, growers copy it vegetatively: they take a bud or shoot and graft it onto a rootstock. The fruiting part of a Cox’s Orange Pippin tree belongs to a lineage propagated from the original tree for around two centuries; the rootstock has its own genetic identity. The same principle applies to Conference pear, Bramley and many other commercial fruits.

A clonally maintained fruit "variety" is not a population bred to a specification, as a wheat variety might be. It is *one individual*, indefinitely copied, with only occasional variations arising over time (see below). Strawberries and cane fruit are also commonly multiplied vegetatively, using methods such as runners, suckers, cuttings and tissue culture, on shorter production cycles than orchard trees.

"Clones" within a variety

Variation can also arise within established clonal varieties through somatic mutation – a random genetic change in a bud or branch (known as a “sport”). A Gala branch may produce redder fruit; a nursery propagates from that branch; the resulting ‘sport’ may then become a new commercial variety.

Why clonality matters for gene editing

Commercial bananas are a good example of why clonality matters for gene editing. Popular banana varieties, such as the Cavendish, are sterile; new plants are grown as clones from suckers or in the lab. Every new plant is a genetic copy of its parent. That means any change made by gene editing is passed on intact, but so is any other genetic change that arose along the way.

With most crops, breeders can ‘clean up’ after editing, provided they know what to look for. They cross the edited plant with others and pick offspring that keep the wanted change but remove or lose unwanted extras, such as residual foreign DNA from the editing tools.

With a sterile clone like the Cavendish, that route isn’t available without losing the variety itself. A 2025 banana editing study highlights this problem and the need to check the plant’s DNA carefully before choosing which plants to multiply.

This raises three separate questions: Is the intended edit there and stable?; Did the editing cause other, accidental changes (known as off-target effects)?; and Did growing the plant in the lab introduce random changes of its own? Showing that the intended edit is stable doesn’t answer the other two questions. The third question acknowledges a scientific reality.

The ‘National List’

The GB and NI National List of Varieties of Agricultural Plant Species and Vegetable Plant Species (often referred to simply as the ‘National List’) covers major agricultural crops, vegetables and potatoes. For any variety within these broad groups to be commercially marketed or sold in the UK, it must be officially registered on the list.

Fruit and fruit propagating material is governed separately.

A 2026 study of walnut cells grown in the lab, published in *PNAS*, found mutation rates more than 3,500% higher than normal, along with duplicated and missing sections of chromosomes. While lab growing is used for some conventional fruit plants too, in a clone, any genetic changes are copied into every plant that follows.

To answer these questions, one would need to know what was tested, what it was compared against and over what time period. Being a clone doesn’t make a crop unsafe. But it does mean the evidence required should be appropriate to how that crop is actually produced, rather than relying on evidence from unrelated crops – which the government PBO process currently accepts as valid.

Regulating conventional fruit propagating material

In England, the sale of fruit plants and fruit propagating material is governed by the Marketing of Fruit Plant and Propagating Material (England) Regulations 2017. They carry over EU Directive 2008/90/EC and apply to listed genera, including apples, pears, plums, cherries, strawberries, raspberries, currants and blueberries. Wales, Scotland and Northern Ireland have their own near-identical regulations. Bananas and grapevines are not covered by these regulations.

The Fruit Propagation Certification Scheme (FPCS), run by APHA's Plant Health and Seeds Inspectorate, is not a separate regime. It is how the certification part of the Regulations is delivered in practice.

The 2017 Regulations set a compulsory minimum standard for everything sold, known as CAC (Conformitas Agraria Communitatis). They also create an optional ladder of official certification, with three categories: pre-basic, basic and certified.

What is required

An official identity for the variety. Before plants can be sold, the variety must be registered, protected by plant breeders' rights, or the subject of a pending application for either. Registration under Schedule 4 requires official tests showing the variety is distinct, uniform and stable (DUS). The result is an "official description" against which later checks of trueness to type are made. Older varieties marketed before 30 September 2012 can instead rely on a lighter "officially recognised description."

Registration as a supplier. Anyone who sells fruit plants or propagating material, whether the breeder or a nursery licensed to multiply the variety, must be on APHA's register of suppliers.

Vegetable clones

A number of vegetables are propagated from true clones, cuttings and divisions. These include rhubarb crowns, globe artichoke offsets, asparagus crowns, garlic cloves and shallot bulbs.

Vegetable propagating material is regulated by the Marketing of Vegetable Plant Material Regulations 1995.

Gene editing of these triggers all the same questions as clonally propagated fruits.

The CAC minimum standard. Every plant sold must be true to its variety, substantially free of listed pests and diseases and free of defects that affect its quality. Suppliers check this largely themselves, keep records and send a supplier's document with each consignment.

What is optional

Official certification. A supplier who wants to sell pre-basic, basic or certified stock enters the FPCS. The material is then officially inspected and tested, grown under conditions set for each crop and sold under an official label. Certification is voluntary in law, but anyone selling certified plants to commercial growers must be in the scheme and commercial growers generally expect certified stock.

Plant breeders' rights. These are a form of intellectual property, not a quality or safety check. A breeder can use them as the route to an official description, or alongside registration, to control propagation and collect royalties.

The Approved Health grade. A lower, voluntary health grade for some soft fruit, which sits outside the statutory categories.

Trials. Material grown for trials or evaluation does not need a variety description, according to APHA's varietal identity guidance.

These routes are not interchangeable safeguards. Registration establishes what a variety is. Plant breeders' rights establish who owns it. CAC and certification deal with the health and quality of the plants being sold. The trials exemption covers material that is not yet commercial at all.

What about precision bred fruits?

In England, the genetic modification process more widely known as gene editing is known as “precision breeding,” and the crop and food/feed products of precision breeding are called “precision bred organisms” or PBOs.

A precision-bred fruit variety in England passes along two tracks. The first is the precision breeding regime, set by the Genetic Technology (Precision Breeding) Regulations 2025. The developer submits a marketing notice to Defra, the Advisory Committee on Environmental Releases (ACRE) advises and the Secretary of State issues a precision bred confirmation notice, which is published on the Precision Breeding Register. If the plant is to be used for or in food or feed, the developer must also obtain a food and feed marketing authorisation from the FSA.

The second track is the fruit marketing regime described above.

These two tracks should be connected, but currently none of the fruit marketing regulations, in England or elsewhere in the UK, has been amended to recognise or regulate precision bred organisms.

Do the fruit regulations' GM rules apply to PBO varieties?

The 2023 Genetic Technology (Precision Breeding) Act and its 2025 Regulations removed precision-bred GMOs from the existing GMO regime.

Even so, there is not a universal alignment between all regulations that refer to genetic modification and/or precision breeding.

The UK organic regulations are a case in point. Under these, a precision-bred organism is still considered a GMO and must be kept out of the organic supply chain.

Similarly, the Genetic Technology Act and Regulations apply only in England. In Wales and Scotland, a precision-bred plant is still a GMO and in Northern Ireland EU GMO law continues to apply under the Windsor Framework.

Each nation's fruit regulations also accept variety registrations made elsewhere in the UK, so a precision-bred fruit variety registered in England could appear on a list that Welsh and Scottish suppliers rely on, even though their own law treats it as a GMO. This lack of coherence means that breeders, growers and food businesses that wish to avoid PBOs will need to devote extra time, energy and money to ensure a PBO-free supply chain.

Defra's February 2025 precision-bred plant varieties consultation described precision-bred fruits as remaining subject to GMO treatment under plant varieties and seeds legislation until that legislation was changed.

The consultation documents proposed PBO information on fruit labels and CAC documents as a future option, but that proposal has not been implemented (see "Government inaction on PBO fruits creates uncertainty" below).

Defra has not said whether the fruit regulations' GM provisions apply to PBO fruit or, if not, what replaces them.

If the GM provisions do not apply, a precision bred fruit variety becomes indistinguishable from a conventional one – and therefore invisible – once it enters the fruit system. The variety register records name, species, description type and dates, not breeding method. CAC supplier documents need only state GM status; there is no provision for PBOs.

FPCS labels have no breeding-method field. A nursery, grower or organic certifier would have to check the Precision Breeding Register themselves and even then could not reliably match plants to a register entry because the register does not note the variety name and currently there are no proposals to include unique identifiers on PBO crops or foods.

Genetically modified fruit varieties

A genetically modified (GM) fruit variety must also meet extra conditions. Schedule 2 covers the labelling of GMOs, while Schedule 4 covers authorisation for cultivation obligations that originate in the EU parent Directive. A GM fruit variety can be registered only if it is authorised for cultivation and, where relevant, for food and feed and it stays registered only as long as that authorisation lasts.

From 7 October 2025, a CAC supplier's document must also state that a variety is GM. In practice, these provisions have never been used.

APHA's GM Inspectorate confirms that there are no commercial releases of GM crops in the UK.

Loopholes in tracking PBO plants

Under the 2017 Regulations, a plant can normally be sold only if two things are true. The supplier must be registered. The plant must also belong to a properly identified variety and meet set quality standards.

But there are several ways gene-edited fruit could avoid those variety checks.

- **The trials exemption.** Plants grown for trials, research or breeding selection don't have to meet the variety requirements. Only the supplier still needs to be registered. Simplot says its current strawberry work is "line-selection trials," meaning it is still testing which plants to take forward. If that's right, its strawberries don't yet have to be identified as a recognised variety.

- **Keeping the plants in-house.** The 2017 rules apply to selling *plants*, not the fruit people eat. A company that breeds and multiplies its own plants and never sells them to outside growers may not trigger the variety requirements at all. It is unclear whether supplying plants to contract growers who farm on the company's behalf counts as "selling" under the rules. This needs clarifying.

- **A gap between the plant and the fruit.** Once the strawberries themselves go on sale as food, they come under the separate approval process for precision-bred food. So the food may be approved while the plants it grows on are never clearly identified.

The identity problem: is an edited Cox still Cox?

The precision breeding framework asks what might have happened to a plant’s DNA. For clonally propagated fruit, the existing system has to answer a different question: what plant is this? The two questions are related, but they are not the same and answering the first does not settle the second.

In fruit, identity is not a fixed genetic fact. It is maintained through continuing practice. Mother plants, nursery records, grafting skills, clone designations and growers’ knowledge connect the trees sold today to the variety people believe they are growing and eating. A name such as Cox records that continuity. It is also an asset with commercial value.

A precision bred Cox apple may descend from Cox, resemble Cox and keep most of the qualities for which Cox is valued. Whether it is still Cox is a separate question and genetic similarity alone cannot answer it. Established varieties already accommodate some variation. Yet relatively small differences can also be enough to create a new variety. The issue is where the boundary of an existing variety lies and on what basis.

Legally, part of that answer comes from the DUS characteristics for the crop, which can be physiological (how the plant functions, such as when it flowers) as well as morphological (how the plant looks). An edit that alters flowering, as Simplot has declared for its strawberries, raises different questions from one that leaves every assessed characteristic unchanged. An edited plant may therefore qualify as a new variety, or it may be judged insufficiently distinct to register separately. Neither outcome tells a purchaser whether the plant has been gene edited.

In addition, under the International Union for the Protection of New Varieties of Plants (UPOV) framework, a denomination should not mislead about a variety's characteristics or identity. If a gene-edited plant keeps an existing name, that requirement is directly in play. UPOV also requires a new variety to have a name that differs from those of existing varieties of the same species. If a gene-edited Cox is registered as a new variety, it cannot be called Cox; if it is not, it can be sold as Cox with nothing to show it has been edited.

Even an official description fails to capture everything a variety is. This exposes a gap in the language of "traditional processes." In the precision breeding framework, the phrase refers only to processes by which a genetic feature could have arisen.

In fruit growing, tradition also covers the work and institutions through which a plant is recognised, maintained and passed on. Showing that an edit could have arisen through a legally defined traditional process does not show that the resulting plant shares the original's horticultural, commercial or cultural identity. These characteristics can become a legal battleground if a traditional variety also has a geographical indication. The lengthy legal battle over Forced Yorkshire rhubarb – a clonally produced vegetable crop – is a good example of this.

The question is therefore one of authority as well as classification. Who decides whether an edited plant still belongs within an established variety and what information must accompany that decision?

Two products, different routes to market

The 2025 Precision Breeding Regulations require PBO confirmation and specified application information; they do not expressly make fruit-variety registration a prerequisite for food authorisation.

The FSA application register, last updated on 1 October 2026, lists three PBO applications: Rothamsted's ACRYLOW Cadenza 23 wheat, Simplot's S4A strawberry and Tropic's reduced-browning banana. All three are recorded as in progress at the recommendation stage. This is not authorisation, but it shows that the food approval

process is advancing while important gaps in the wider regulatory regime remain unresolved.

Simplot's strawberries

The Simplot marketing notice covers eight strawberry lines edited to extend their flowering and harvesting season. Simplot's notice says the English trials will include "value chain consultation and taste testing" to select lines for future production and fresh-fruit marketing. It does not say if the strawberries will undergo any additional field testing.

~~covers eight strawberry lines, with separate administrative designations. The declared edit concerns flowering behaviour and a longer harvest season. The notice does not name the parent variety. It describes line-selection trials, followed by commercial production once selection is complete and says the lines have been 'registered for production in England'.~~

Defra has given each line its own reference code. But the public record doesn't say which existing strawberry variety each one was made from. Nothing requires that code, or the fact that the plants are gene-edited, to travel with the plants when they're sold under the basic EU-derived quality standard (known as CAC, see above). So Defra may know which plant is which, but nurseries, growers, certifiers and others handling the plants may have no way of telling.

The notice says commercial cultivation and marketing will follow once line selection is completed and the lines have been registered for production in England. But it does not identify the registration route or explain whether the edited lines will be treated as new varieties, or as the parent variety with an altered trait.

~~The notice's reference to lines 'registered for production in England' leaves a practical question: registered under which process? Defra should explain the route from the trial lines to commercial planting material, the information accompanying plants supplied to growers and whether the GM statements required on certified labels and CAC documents apply.~~

~~The notice~~It also reports stability testing of the targeted edits over three vegetative propagation rounds (three generations of cloning). This is relevant evidence of edit stability, but should not be presented as answering every question about unintended changes (the notice reports checking only one potential off-target site, despite both the original and cloned material being available to test), performance or identity.

If an unwanted change is present somewhere else in the genome, we won't know about it. Because the strawberries are clones, any unknown changes will be replicated in all

the plants copied from it. Despite this, neither the government nor the FSA has asked for more information.

~~The eight lines also differ from one another: strawberries carry several copies of each gene and in some lines not every copy of the flowering gene has been edited; the size of the edit also varies widely between lines. Yet all eight pass through one confirmation and one Tier 1 food application (the FSA's lowest-risk category, for which no safety assessment is required).~~

Tropic's bananas

The reduced~~non~~-browning banana, produced by Tropic, illustrate~~ss~~ a different route: overseas production and import of harvested fruit. Bananas (Musa) are outside the fruit marketing Regulations' listed crops and imported fruit for eating is not planting material. Its route to market therefore bypasses existing requirements governing an edited apple or strawberry plant supplied to a grower.

How transparent the bananas are in the food system depends on the ability to identify and trace them through the food supply chain, as well as the adequacy of any product-specific assessment.

The plants that produce UK-bound fruit will be multiplied by tissue culture and grown outside any English inspection regime and we found no published method that a port health or local authority could use to confirm that imported fruit is line TRB011002.

Critics, including Prof Michael Antoniou, Emeritus Professor of Molecular Genetics and Toxicology at King's College London, argue that Tropic's evidence does not show that the banana is precision bred or that it is no riskier than a conventional banana.

Writing for GMWatch he notes that Tropic read the full DNA of both the original and the edited banana but did not compare them, which would have been the most direct way to see what had changed. Instead, it compared the edited banana with a standard reference genome from a public database. It then used computer prediction to look for unwanted edits, searching only sites that closely matched the target.

Prof Antoniou says this approach can miss real changes. Editing and the lab steps around it can cause hundreds or thousands of unintended mutations. To support its claim that unwanted edits were "highly unlikely," Tropic relied on a published study of rice, which is not a clonally produced crop. ACRE asked for more information on unintended edits but accepted this evidence, which, Prof Antoniou notes, itself found many mutations caused by the lab steps around editing.

He also questioned the intended edit. Bananas carry three copies of each gene (known as a triploid genome) and the browning gene was disrupted in all three but not removed. The damaged genes, he says, may still produce abnormal proteins “with unknown health consequences.”

Food authorisation does not close the regulatory gaps

Food approval is advancing without these questions being resolved, yet production and marketing cannot so easily be separated. Regulation 30 of the Genetic Technology Regulations requires the Secretary of State to consider health, nutrition, misleading consumers and environmental effects before approval. But it also, paradoxically, prevents the Secretary of State from performing any test on a PBO that would not apply to an ordinary food.

The FSA, by contrast, is not restricted as to the kind of testing it can perform or any further enquiries it might make. Yet the FSA register records that a safety assessment is “not required” for the strawberry, banana and wheat applications.

With no published evidence of completed DUS testing or a confirmed variety-marketing route for the strawberries and no clear explanation of how the imported bananas will be identified through the supply chain, serious questions remain about how these products can move from regulatory approval into a lawful, verifiable place in the market.

For both fruits, Scotland's and Wales’s decision not to adopt England's PBO regime adds a further layer of complexity. The FSA's guidance states that authorised PBO food produced in England can be sold into Scotland and Wales under the UK Internal Market Act (UKIMA), though both Scotland and Wales have questioned this.

Importantly, under UKIMA a “significant production step” or "significant processing" in Scotland and Wales means a PBO is treated as a GMO that requires approval under each nation’s GMO regime. The definition of a significant production step or significant process is broad. It can encompass growing or farming a precision-bred crop inside Scotland or Wales. It can also involve taking a raw material such as a tomato and turning it into ketchup or slicing it into a prepackaged sandwich. It can also encompass slicing a banana or strawberry into a smoothie or a prepackaged fruit salad.

Tropic expressly says it intends to market its banana for fruit salads, smoothies and other cut-fruit uses, which is exactly the kind of “further processing” that would bring GMO rules back into play if it took place in Wales or Scotland.

Businesses therefore need to know both what they are handling and which rules apply to its intended use. Without reliable identification and accompanying information,

English food authorisation risks passing unresolved compliance problems along the supply chain.

Government inaction on PBO fruits creates uncertainty

Nearly two years on from Defra's February 2025 consultation on precision-bred plant varieties, there is still no mandate to label precision bred seeds or identify PBO status on the National List. The separate legislative work for fruit, ornamentals and forest reproductive material has still not begun. Yet PBOs are in the process of being approved for commercial planting, food and feed.

These approvals are taking place against a unique backdrop. In May 2025, Beyond GM brought a judicial review against the Genetic Technology Regulations 2025. In June 2026, the High Court ruled that the precision breeding regulations were made on an unlawful basis. At the time of writing, the court has yet to decide what the remedy will be for this unlawfulness and yet the government is pressing ahead with operationalising the regulations.
Amongst its findings, the judgment recorded the decision to mandate PBO seed labelling, subject to the proposed SPS agreement with the EU and described the likely focus on seeds rather than resulting plants as problematic.

What is still missing is a clear line that runs between a plant's confirmation as precision bred and the planting material that is actually sold. That would require three things: an identifier that nurseries, growers and certifiers can recognise, reliable information travelling with the plants and a plain account of who must do what at each stage. Publishing a notice on a register does not provide any of these.

The EU approach: connecting gene editing to the planting-material system

The EU is also changing its rules for gene-edited plants, but it is making explicit connections between their regulatory status and the system governing varieties and planting material.

Two measures apply: the NGT Regulation, which applies from 17 July 2028 and the agreed plant reproductive material (PRM) text, which still awaits formal adoption and would apply later.

The agreed PRM text requires variety registers to record a variety's NGT status and the identification numbers of the plants it came from and provides for lists of selected fruit and vine clones linked to registered varieties.

The separate NGT Regulation's Article 10 requires NGT-1 reproductive material supplied to third parties to carry an NGT-1 label and identification numbers. This includes vegetative planting material and material supplied for breeding and scientific purposes – not simply commercial seed.

England's outstanding problem is how comparable connections are to operate. PBO confirmation identifies an organism within the precision breeding regime, but does not explain its route through the fruit-marketing rules or establish what information must accompany commercial planting material. APHA's current guidance acknowledges that further legislative changes are needed to enable precision-bred varieties to be listed and their reproductive material marketed as PBOs rather than GMOs.

Defra must explain whether this applies to PBO fruit and, if not, what legally effective replacement will identify that material to purchasers. Its EU comparison is strongest for planting material such as Simplot's strawberries. It does not resolve the imported-banana problem: NGT-1 harvested food will not carry mandatory GMO labelling, leaving a break between upstream identification and consumer-facing transparency. Nevertheless, the EU approach demonstrates that deregulation need not erase edited origin from the planting-material system. England has yet to explain how that information will reliably follow PBO fruit plants into commercial supply.

Unresolved questions

The fruit questions add a concrete test of whether the regime has been worked through in practice.

These should be answered before commercial expectations harden around arrangements that growers and certifiers cannot reliably navigate.

Defra needs to explain the rules as an operating system, not as disconnected approvals. The following questions would help establish where obligations survive, where information is missing and which legislative work remains unfinished:

Legal status and the route to market

- What PBO-specific fruit legislation is under preparation, what does it cover and when will it be brought forward? How does it relate to the work announced in February 2025 and the fruit amendments effective from October 2025?

- Do the GM requirements in Schedule 4 and Schedule 2 apply to confirmed PBO fruit varieties? If not, what precise legal provisions disapply them? If they do, how are the cultivation-authorisation *and* disclosure requirements to be met?

- Which of the regulation 7 routes to an official variety identity are available to PBO fruit, including rights and pending applications and what identification and disclosure duties apply under each? How will Defra prevent a choice of route from making PBO status harder to establish?

- What conditions and record-keeping duties apply to line-selection trials under the trials exemption (regulation 6) and where is the boundary between trial material, commercial planting-material supply and marketing food?

- Which current requirements govern vine propagating material sold in England? Is there a statutory catalogue or certification scheme for varieties and clones and what will identify precision-bred vines to purchasers?

Identification and traceability

- What does Simplot's proposed registration 'for production in England' mean? Which body will register the selected lines, under which legislation and what information must accompany plants supplied to growers?

- Where is the Schedule 4 fruit register published, what does it contain and will it record PBO status and link that status to the designations used in PBO notifications and planting-material documents? Will the same identifier accompany commercial consignments, allowing purchasers to connect the plants supplied with the relevant register entries?

- What legally required information will enable organic nurseries, growers and certifiers to identify and exclude PBO planting material? How will that information connect variety and clone identities, PBO register entries and the labels or documents accompanying consignments, including where edited material retains a familiar variety name?

Evidence

- What crop-specific evidence supports the approach to unintended changes, vegetative stability and coexistence in clonal fruit? Who will verify that evidence?

Variety identity and who decides

- How will Defra determine whether an edited fruit plant remains within an existing variety, constitutes a selected clone, or requires registration as a new variety? What evidence will establish its identity and how will its edited origin remain identifiable if it retains a familiar variety name?

- Who will be involved in deciding how established variety names may be used for edited material? How will those decisions take account of the interests of growers, nurseries, conservators and consumers, alongside those of developers and rights holders?

These are practical questions about material entering farms and supply chains, but they also concern the terms on which familiar fruits are carried into the future. Recognising a plant as precision bred does not resolve whether it remains the same variety, what its name should communicate, or who should participate in those decisions.

In addition, many vegetatively propagated/clonal fruit varieties are considered “traditional” varieties – a designation that has both cultural and commercial value. The language of “traditional” as used in the Genetic Technology Act and by developers themselves, risks borrowing the authority of fruit-growing traditions without accounting for the practices, relationships and responsibilities that sustain them.

Annex 1 Case Study: Grapevines and varietal identity – another gap

Grapevines illustrate why confirming a plant's precision-bred or NGT status does not, by itself, establish a complete route to market. Separate questions arise about selling its propagating material, recognising its varietal identity and using a familiar variety name on the resulting wine.

In some plants, particularly grapevine, a variety encompasses many distinguishable clones. Centuries of somatic mutation mean that "Pinot Noir" comprises dozens of officially recognised clones with different vigour, yield and flavour profiles. The related varieties Pinot Gris and Pinot Blanc are colour mutations of Pinot Noir – genetically near-identical, but treated as separate varieties because the difference is stable and visible.

In England's 2017 Regulations, grapevines *(Vitis*) are not within scope. In the EU, vine propagating material is governed separately by Directive 68/193/EEC. The UK has historically relied on a derogation from implementing that directive. There is, as far as we can ascertain, no equivalent English variety-and-clone marketing framework.

This does not mean that English vine planting material is entirely unregulated. Plant-health controls, including applicable plant-passport requirements, remain a separate consideration. Equally, rules governing winemaking practices and wine labelling do not themselves establish a system for identifying PBO vines supplied to growers.
These unaddressed gaps arise at a moment when English wine is experiencing a notable surge in popularity.

Questions being asked in the EU

In the EU, a recent analysis by Reinhardt and Monaco distinguishes biotechnology regulation, plant variety rights, propagating-material rules and wine law. Each serves different purposes and permission under one does not automatically satisfy the others.

The authors identify a potential difficulty for gene-edited vines intended to preserve a traditional variety's commercial identity. An edit might change disease resistance or another characteristic without producing the distinctness needed for recognition as a new variety. Yet the edited plant might also encounter difficulties qualifying as a selected clone of the existing variety. They question whether creating an edited plant through cell culture fits rules developed around selecting variation within established vine populations.

Since this paper was published, there has been a provisional agreement to amend various EU directives on the production and marketing of plant reproductive material

(see "The EU approach" above). This agreement, which is still awaiting formal adoption, changes some of the legislative context considered by the authors.

NGT status is recorded at the registered-variety level, but it does not expressly require that status to be repeated in the separate national list entry for a selected clone or polyclonal material – even though the EU's new NGT Regulation requires NGT-1 identification of plant reproductive material to be supplied to third parties. That is a transparency gap if users consult the clone list without cross-checking the national variety register and the NGT register.

Disclosure of edited origin and confirmation of varietal identity remain different and disconnected questions. Also unresolved is the question of whether creating an edited plant in cell culture is the same as selecting a clone from an existing population.

Traditional names and collective decisions

The central distinction highlighted by Reinhardt and Monaco is relevant: recognition of NGT status does not establish whether an edited vine qualifies as a new variety or an acceptable selection within an existing variety.

The authors propose interpreting “variety” more autonomously in wine law, allowing the consumer-facing name to reflect wine identity rather than necessarily following every distinction used in propagating-material registration or intellectual property. This would not, by itself, resolve restrictions on supplying planting material and geographical indication specifications could impose additional conditions.

The wider question is who decides what continuity with a traditional variety means. A familiar name carries accumulated expectations about origin, cultivation, flavour and collective heritage. Whether an edited derivative should retain that name cannot be answered solely by confirming NGT status or checking a limited set of varietal descriptors.

England may therefore face a different version of the same identity problem. The absence of the particular EU framework discussed by the authors ~~would not demonstrate that England has an adequate replacement~~is also a problem in England. The government must now explain how edited vines will be classified, what evidence will establish their identity and how growers and purchasers will~~growers and purchasers will~~ recognise their edited origin – including where a familiar variety name is retained.