

A Bigger Conversation Webinar
Is Gene Editing a Sustainable Food System Solution?
27 June 2024
Q&A

Please note: some questions were answered in writing or live in the session; others were answered by panellists after the session. See the video at <https://youtu.be/m8uEnzIBP1o> for context.

Andrew Planet 02:07 PM

Would gene editing annual or biannual crops to grow into long term perennials be more sustainable in terms of work needed for crop production and preventing loss of ground cover?

Andrew Planet 02:10 PM

Would gene editing livestock or plant crops so that there is no need for males in the production generation be an advantage?

Anonymous attendee 02:20 PM

How is genetic integrity to be understood with regard to the natural variation in genomes due to mutations occurring naturally? What distinguishes those natural changes from gene editing?

This question was answered live

Veronica-Mae Soar 02:37 PM

to what extent has there been any research into the natural response of plants, to react to anything detected as a threat. We know this happens.

Anonymous attendee 02:37 PM

Hi Sarah, I work in shaping markets and was very interested in your talk. Regarding the corporate power, how would you propose that small scale farmers or other actors in the market aim to take back this power? Does it need to be government led or do you think networks of actors in the system can change the institutional norms currently seen?

This question was answered live

Siguna Mueller 02:38 PM

To Angelika. What would you say to those who argue that all possible interactions, even those outside of human understanding, will be grasped and understood by AI?

Anonymous attendee 02:41 PM

How can it be claimed that biotechnology has never provided any beneficial contribution to society, when COVID and the respective biotech-derived vaccines which saved many lives are just in the recent past?

Pat Thomas 02:54 PM - Answered during the session

Thank you for your question. For this session we are focussing on agricultural GMOs/gene editing and I think that context was clear in Angelika's presentation.

Anonymous attendee 02:42 PM

Angelika, many gene edits make a change in an organism that mirrors an existing genotype in another variety/breed of the same species so the context is actually very similar - you therefore overstate the risk. The problems you are now describing regarding the launch of technologies are a problem of the economic demands on businesses not the technologies themselves.

Daniel Lynch 14:47 PM

Hi Angelika, my name is Daniel and I'm based in the UK. I've heard a common argument among proponents of GMOs is that the reason GMOs haven't taken off as much as they could have is because the regulatory regime brought in in the EU was very restrictive. I've also heard that low consumer demand and mistrust of GMOs has also led to a low take up of GMOs among businesses (I don't think any major supermarkets sell GMOs in the UK), which has discouraged the development of this technology. Wondered what your thoughts on this were?

Anonymous attendee 02:48 PM

Have any of you an opinion on Argentine drought resistant wheat?

Pat Thomas 02:58 PM – Answered during the session

Our speakers may have an opinion but my understanding is that the yields of the drought resistant wheat were disappointing but also that the 'sell of drought tolerance obscures the fact that the HB4 wheat also expresses the gene that give a tolerance to glyphosate ammonium as an alternative to glyphosate. thus may in the end increase use of this herbicide over the long run.

Veronica-Mae Soar 02:51 PM

do you agree that sustainable means you can go on doing whatever it is.

Ralph Early 02:57 PM

Taking Nic Lampkin's point about trade-offs in sustainable food systems, if we are to approach or even reach capability to create sustainable food systems will that inevitably mean matching food production in different geographies/environments with local ecology? Essentially fine-tuning food production systems in concert with local ecology? So, what works in one place will differ from what works in another, in contrast to corporate agri-business notions that one size fits all.

This question has been answered live

Claire Bleakley 02:59 PM

Nic, please can you explain the use of desiccation with herbicides in relation to building soil?

Nic Lampkin - Answered after the session

Herbicides for desiccation are used to dry a crop prior to harvest, reducing or avoiding the need to dry in store by blowing air through, not for soil building. The reasons herbicides are used in zero tillage systems is to kill existing vegetation so that the new seeds germinating can get a head start. Traditionally tillage was used to bury the vegetation and kill it that way - herbicides reduce the need for this. In the long term, the continuous use of one approach to soil preparation can select a weed problem that is adapted to it - so a reduced tillage system as in organic farming might need to have shallow ploughing once or twice in the rotation (usually after the grass/clover ley) with other forms of reduced tillage after annual crops, because the vegetation cannot be removed using herbicides.

Silvia Alonso 02:59 PM

Thank you, Pat!

Jon Carapit 03:00 PM

any perspectives on liability and financial instruments (e.g. bonds, insurance) to manage risk. Claims are that 'The technology has changed in 20 years' - but Nature is still as complex. Have insurance industry changed and willing to cover risk?
<https://scholarlycommons.law.emory.edu/cgi/viewcontent.cgi?article=1315&context=elr>

Andrew Planet 03:01 PM

Is there any movement in large scale agriculture to produce more productive long term ecological climaxes using perennials multi-cropped with shorter lifetime plants, along with livestock?

Nic Lampkin - Answered after the session

There is quite a lot of interest, also among larger-scale farmers, in agro-forestry, which can work well with both crops and livestock. Where crops are mechanised, however, this will tend to require trees to be in straight lines, as in alley cropping. (Nic)

Leonie Nimmo 03:03 PM

Thanks all for fascinating and thought-provoking talks. Dr. Sarah Hackfort, Dr. Angelika Hilbeck. I had a conversation with an undergraduate Ecology student in the UK and discovered that they were being taught about the “benefits” of gene editing with no attempts at critical analysis. Given the number of educational institutions that are developing products and processes using genetic technologies, what can be done – and have there been any initiatives so far – to ensure that Universities are developing courses that are balanced and responsible?

This question was answered live

Claire Bleakley 03:05 PM

Please can you explain why organic growing yields less? there is less waste and food waste is a real problem in the food system?

Nic Lampkin - Answered after the session

The biggest reason is the none-use of nitrogen fertiliser - the biggest yield differences are found for crops like wheat in northern Europe where N-fertiliser tends to be used in high quantities in conventional production. The yield differences tend to be much lower for legume crops like peas, beans and clovers, because they fix nitrogen biologically, not requiring synthetic N-fertilisers. Pests and disease can also reduce yields - this tends to be more of an issue in horticultural crops (fruit and vegetables). But there is potential to mitigate these yield reductions, by reducing livestock numbers, feeding ruminant livestock on clover/grass herbage mixtures, reducing consumption of livestock products, and reducing food waste. There are studies indicating that organic consumers may actually require less land per person to feed them because of the reduced use of livestock and processed products. I think there is also an argument that food waste might be less with organic consumers, due to greater awareness and the price of organic products. But I have not seen any research evidence supporting this last point. But food waste is a real problem, and if organic consumers do make a difference this should be paid more attention!

Anonymous attendee 03:06 PM

It is very disappointing to be invited to something called "a conversation" and find it is such a one-sided panel of highly opinionated speakers

Anonymous attendee 03:11 PM

Lifting up the 1st question that is often asked: How is genetic integrity to be understood with regard to the natural variation in genomes due to mutations occurring naturally

Frances Robinson 03:13 PM

Angelika - the same problem exists regarding biomedical research involving the use of other animals as substitutes for the human condition. Species-specific genetic differences and species-specific differences in patterns of gene expression give rise to species-specific differences in functioning at the cellular level. Please see the book RAT TRAP by Dr Pandora Pound. Thank you.

Jon Carapit 03:15 PM

Another Complaint - some people watching this webinar seem to not have heard the concern about not having uncritical 'Faith' in mechanistic reductionist paradigm

Elisa d'aloisio 03:15 PM

Not wanting GMO crops in the field is not anti-science but imposing them without risk assessment is

Chris Till 03:17 PM

Could you apply this intentional design critique to any human endeavour in any aspect of agriculture (i.e. intercropping etc)? If so, what hope do we have?

Nic Lampkin - Answered after the session

Potentially, yes, as the same tensions between thinking about specific technologies and practices rather than systems exist in other sectors (such as pharmaceuticals, energy). There is a general need to encourage systems thinking as part of developing solutions to the challenges we are facing.

Siguna Mueller 03:19 PM

My question is particularly about super- AI, i.e. when AIs "consciousness" and capabilities are said to surpass those of humans

Craig Lewis 03:21 PM

To the point that Angelika is making on the need to understand consequences. I wonder how does this fit with the long-established use of mutagenesis methods in plant breeding where random structural changes are done and new variation established and then these products used in food systems?

Leonie Nimmo 15:22 PM

Given that we don't actual want the current farming system to be sustained, perhaps we should be thinking in terms of disruptive technologies rather than sustainable food systems?!

Sarah Hackfort - Answered after the session

Yes I agree, but I would argue that we need a notion of technology that includes wide technology and low technology and an understanding of practices which is not limited to high technologies. The same for innovation: disruption of malfunction systems might sometimes require exnovations (e.g., for substances, practices, pesticides) that allow for disruption in the first place

Frances Robinson 15:24 PM

Exactly!

Veronica-Mae Soar 02:51 PM

Will you all be addressing questions and comments and publishing your answers