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# CropBooster-P

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*Roadmap to future-proof  
European crops*

Citizens deliberation and verdict on using  
NGTs to design the crops for the future



European  
Commission

Horizon 2020  
European Union funding  
for Research & Innovation

# Second public engagement: The CropBooster-P citizens juries – Task 3.1B

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- Assess the desirability of NGTs for crop improvements
- Reach a reasoned judgement on the social desirability of having NGTs for improving crops
  - build citizen's competence
  - build bonds of trust among citizens which can effect changes in political attitudes and behavior
  - reduce conflict in policy formulation and decision-making
  - make better, longer lasting, and wiser policy choices



# Project activities in WP 3 – Task 3.1B

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- Formed two online CropBooster-P citizens juries one in the
  - Netherlands – 11 citizens
  - United Kingdom – 10 citizens
- We engaged citizens via recruitment agencies
  - Ages of 20-65
  - From uneducated to high school and university graduates
  - Equal gender (M/F) balance
  - Had no prior knowledge about plant breeding



# Project activities – Task 3.1B

## The citizens jury: Protocol: Day 1-3

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- Presentation explaining our findings were made to the public
  - WP1 – New Genomic Techniques (NPBTs) and the state of the art in crop improvements
  - WP2 – Expert and stakeholder perspectives on the impacts of crop improvements
  - WP3 – Consumer and societal acceptability of NPBTs for crop improvements
- Citizen's deliberation & question formulation session in smaller groups



# Project activities – Task 3.1B

## The citizens jury: Protocol: Day 1-3

- CropBooster-P Work Package presentations were complimented by expert witness testimonies

	<b>Dutch jury</b>	<b>UK jury</b>
Day One	Plant physiology	Plant physiology
Day Two	Responsible innovation in biotechnology	Plant biotechnology & society studies
Day Three	Biotechnology, culture & planning	Environmental economist

- The floor was then open to citizens to cross examine the experts and ask questions that need answering
- The deliberation session, and the Q&As or cross examinations lasted about two hours each day



# Project activities – Task 3.1B

## The citizens jury: Protocol: Day 4

### Evidence based reasoning for verdict formulation





It starts with a brainstorm in the SWOT matrix, and ends with a series of questions to get at the "how what?" stage of decision-making. This will be based on an interpretation of information brainstormed at the beginning.

#### 1 Brainstorm strengths, weaknesses, opportunities and threats to your project here

Ideally, work in an S-shaped flow. Start with strengths, then move to weaknesses, then opportunities, and finally threats.

Add one idea per sticky note. Add as many stickies as they want in the given time limit.

⌚ 10 minutes for each section

<b>STRENGTHS</b> <ul style="list-style-type: none"><li>Start here. Strengths are things internal to new plant breeding techniques. Please highlight these strengths and discuss how they can effect society &amp; the environment</li></ul> 	<b>WEAKNESSES</b> <ul style="list-style-type: none"><li>Weaknesses are also internal factors limit NPB developments. Please highlight these weaknesses and discuss how they can affect society &amp; the environment</li></ul> 
<b>OPPORTUNITIES</b> <ul style="list-style-type: none"><li>Opportunities are external factors to NPBT. These are beyond your control, but are good to be aware of because of the potential benefit. Please write down those that come to your mind in the sticky notes.</li></ul> 	<b>THREATS</b> <ul style="list-style-type: none"><li>Threats are external factors to NPBTs. These are beyond your control, but are good to be aware of because of the potential threats. Please write down those that come to your mind in the sticky notes.</li></ul> 

#### 2 Drag and drop items that are the most important to you in the box below

























⌚ 10 minutes for ranking/voting

#### 3 Evidence based reasoning for verdict formulation

Discuss and answer the following questions to start deciding on your stance on NPBTs.

⌚ 10 minutes for each section

Strategic planning

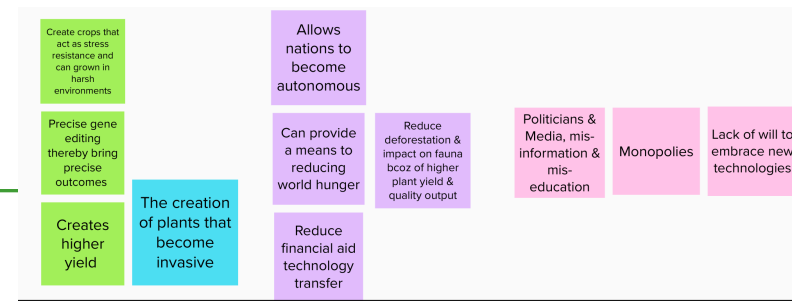
Do the risks outweigh the benefits, or do the benefits outweigh the risks?	What are the most critical issues that have led you to support or oppose new plant breeding for crop improvements?								
What would need to happen to change your mind supporting or rejecting new plant breeding for crop improvement?	What do you think about breeding new plants and improving crops? <table border="1"><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>								
									
									
									
									

Place a green stick with your name if you are inclined to support it  
Place a pink sticky if you are partially for and against Place a yellow sticky if you are undecided  
Place a orange sticky if you are opposed new plant breeding & crop boosting

# Selected results – Most important SWOTs



- Strengths: Develop plants that have higher yield, nutrition & more resistance to stressors
- Weaknesses: i) develop plants with unintended consequences & ii) NPBTs research fails to engage with societal expectations
- Opportunities: i) Higher food and nutritional security, ii) better varieties & iii) reduced environmental impacts
- Threats: i) the lack of will & mistrust in governments & ii) monopolisation



# Selected results – Reasoning in support or against NPBTs

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- Do the benefits outweigh risks? – **Yes**
  - Higher yields & consistent plant output
  - Reduce / eliminate hunger
  - Europe can help respond to food emergencies in the world
- What are the critical factors that led you to support or reject NPBTs?
  - the rigor in science and safety standards in EU
  - NPBTs can help achieve food independence and the nutritional security
  - Lack of transparency and past experience with GMOs





# Selected results – Reasoning in support or against NPBTs

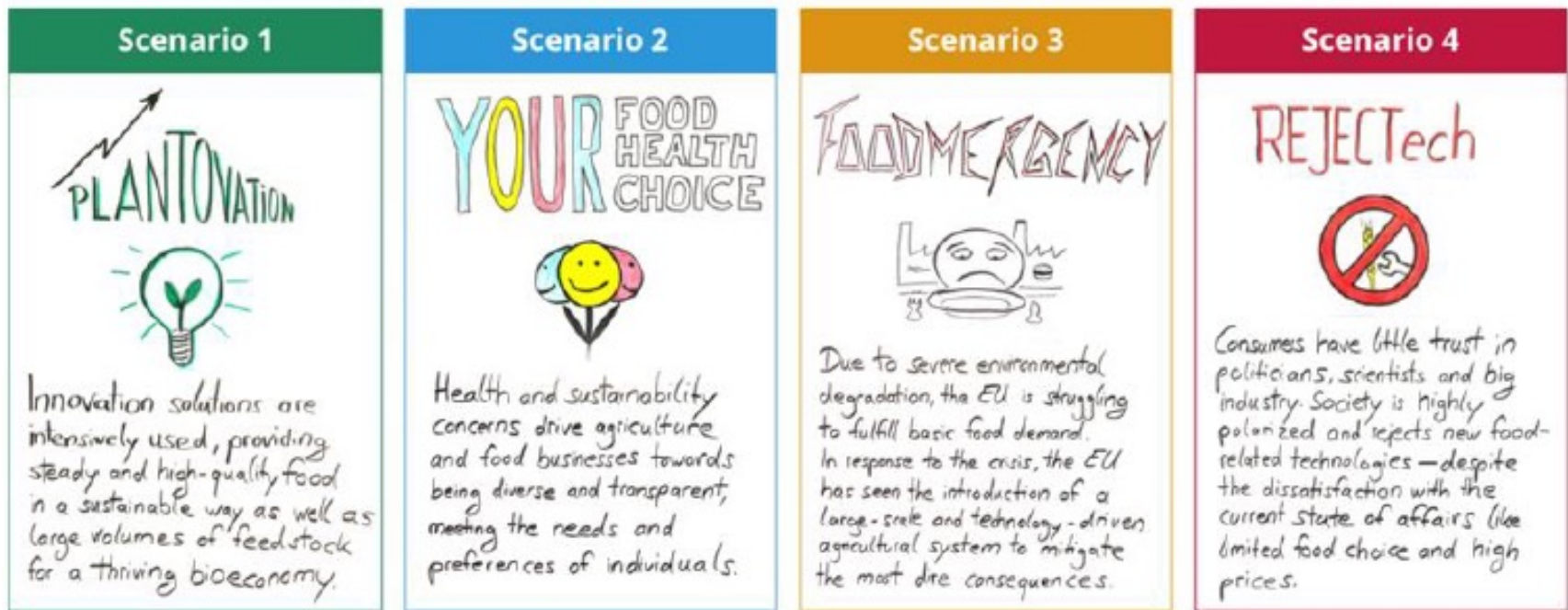
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- What needs to happen for you to support/reject NGTs?
  - More proof of concept
  - Better education & communication about NPBTs
  - Higher rigour in testing
  - Safe & realistic technology deployment
  - Increase allergic reactions or any negative effects and
  - Other successful alternatives technologies



# Selected results: Polls on the current and future scenarios of NGTs

- What is the current state of affairs with NPBTs in Europe?

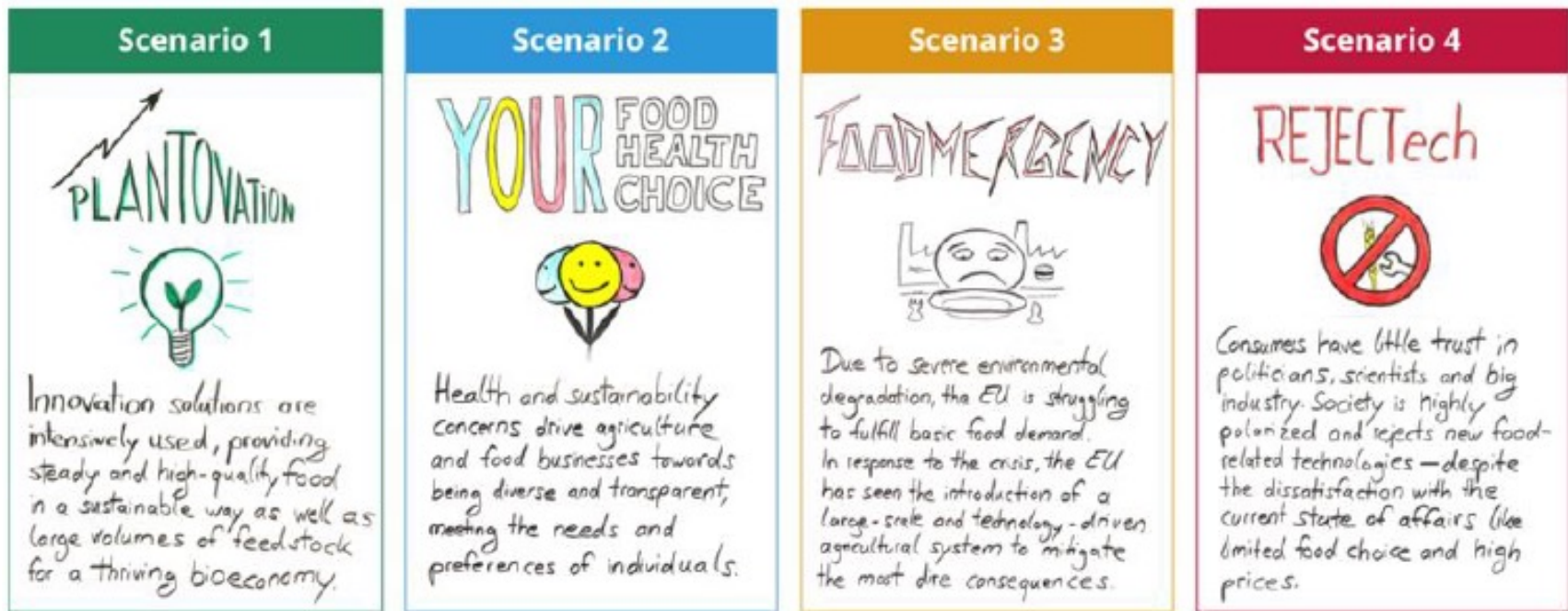


- Dutch jury: **Option 4 - 93% chose option D** & Option C - 7%
- UK jury: **Option 4 - 50%**, Option A & B 25% each



# Selected results: Polls on the current and future scenarios of NGTs

## ■ Where are we heading with NPBTs in Europe?

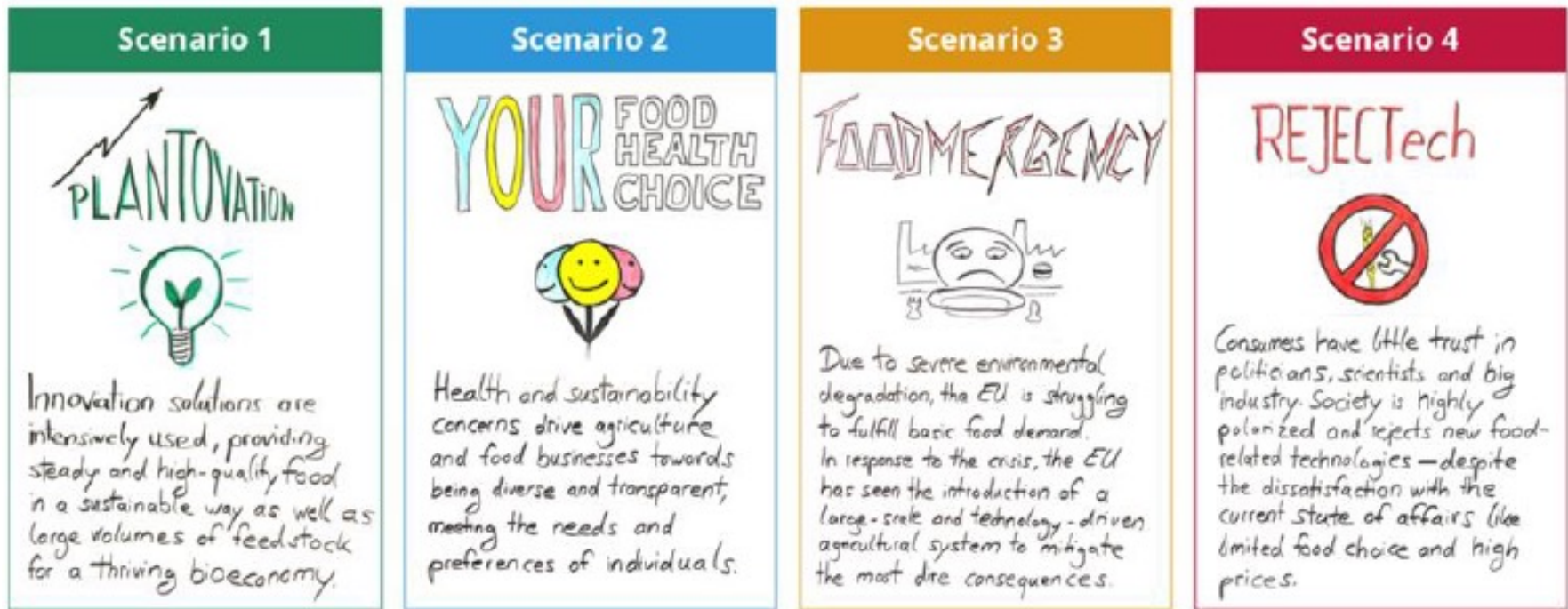


- Dutch jury: **Option 3 - 60%** & **Option 2 - 40%**
- UK: **Option 1 - 57%** & Options, B, C, & D - 14% each



# Selected results: Polls on the current and future scenarios of NGTs

## ■ What is the most desirable path for NPBTs?



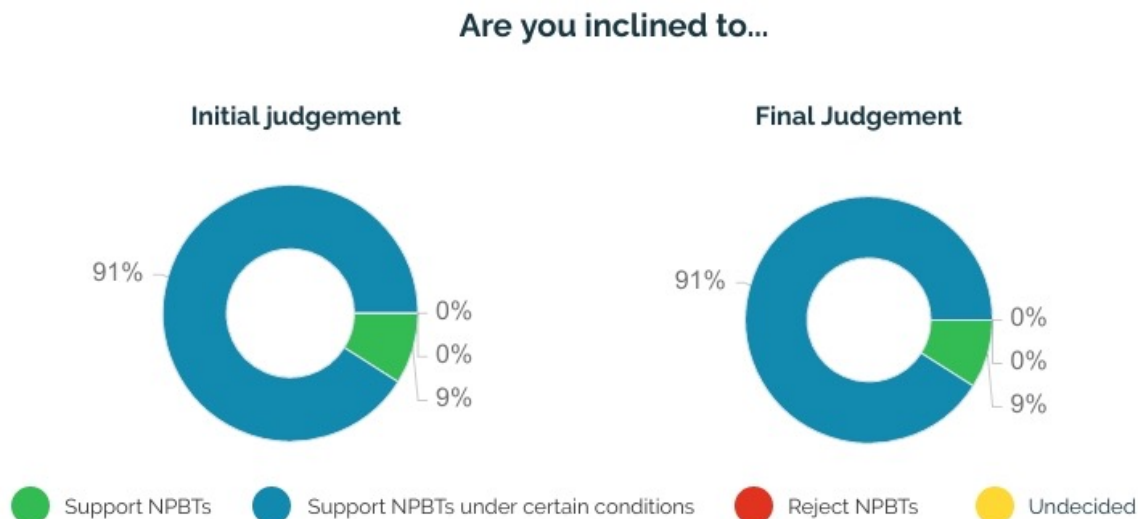
- Dutch jury: **Option 1 - 70%**, Option B - 10%, Option C - 20%
- UK jury: **Option 1 - 75%** Option, Option B - 12%, Option C - 12%



# Selected results – Verdict

## ■ Are you inclined to...

- support NPBTs
- support NPBTs under certain conditions
- reject NPBTs or
- remain undecided

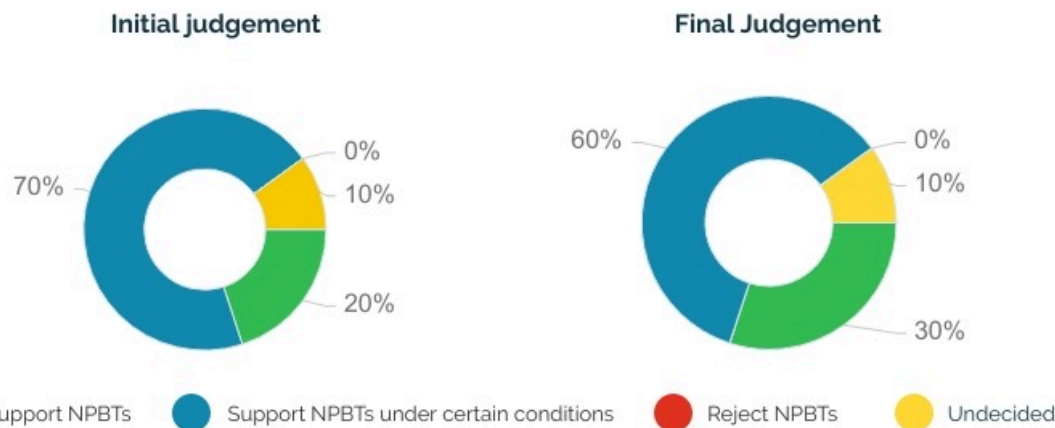


# Selected results – Verdict

## ■ Are you inclined to...

- support NPBTs
- support NPBTs under certain conditions
- reject NPBTs or
- remain undecided

### Are you inclined to...





# Selected results – The conditions

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- Technology should be **accessible to all** and used to solve humanitarian problems first rather than breed crops for solely maximizing profits
- There must be a **regulatory framework** and standards that support the development of NPBTs
- Governments needs to be pro-active in **assessing the ethical, economic and environmental benefits** the technology can bring.
- The food made with these techniques must be at least as **safe and nutritious** as current comparable products.
- This technology must have the **same or less climate impact** per product (weight) compared to current comparable products.
- There must be the possibility to **revert to older plant genetic material** to have a safety net in case of unintended consequences



# Thank You!

