The Costs of Regulatory Delays on GM Crops

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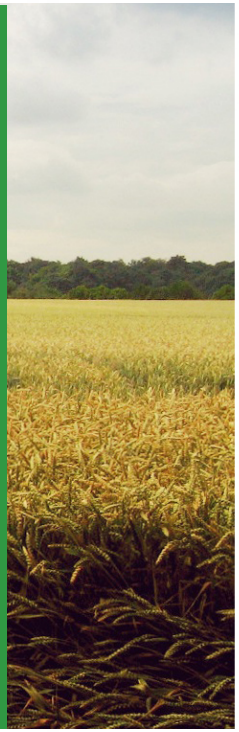
Socio-economic considerations trigger immense costs

Challenge: How to remove politics from crop variety approval



Introduction

- The lack of coordinated international regulatory capacity for GM crops is causing untold delays in the adoption and diffusion of this technology
- Domestic regulatory systems are now part of corporate investment strategies
  - Witness BASF's transfer of research capacity from Europe to USA
- GM crops will be essential to improving global food security, more efficient regulatory systems are a key component to this

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Argentina – Key regulatory steps

- **CONABIA**: Evaluates agricultural and environmental impacts through trials
- **SENASA**: Food safety evaluation
- **DNMA**: Evaluates potential commercial impact focussing on export markets
- **CONABIA** makes final report

Issue	Argentina
Type of inclusion	Mandatory
Scope / What?	Economic impacts on trade and/or competitiveness. Other impacts being considered.
Who?	Minister of Agriculture – special unit DNMA
When?	Commercialization
Comments	For a while..policy of only approving those already approved in trade sensitive markets

Source: based on Falck Zepeda, Wesseler and Smyth, 2010 and Pray, 2010

Distribution of global benefits from GM crops

- Canola: Farmers 43%, Firms 48%, Consumers 5%
- Soybeans: Farmers 32%, Firms 34%, Consumers 25%
- Corn: Farmers 59%, Firms 30%, Consumers 11%
- Cotton: Farmers 75%, Firms 21%, Consumers 4%

- Alston et al 2014, estimate the annual global benefits from GM soybeans to be $46 billion

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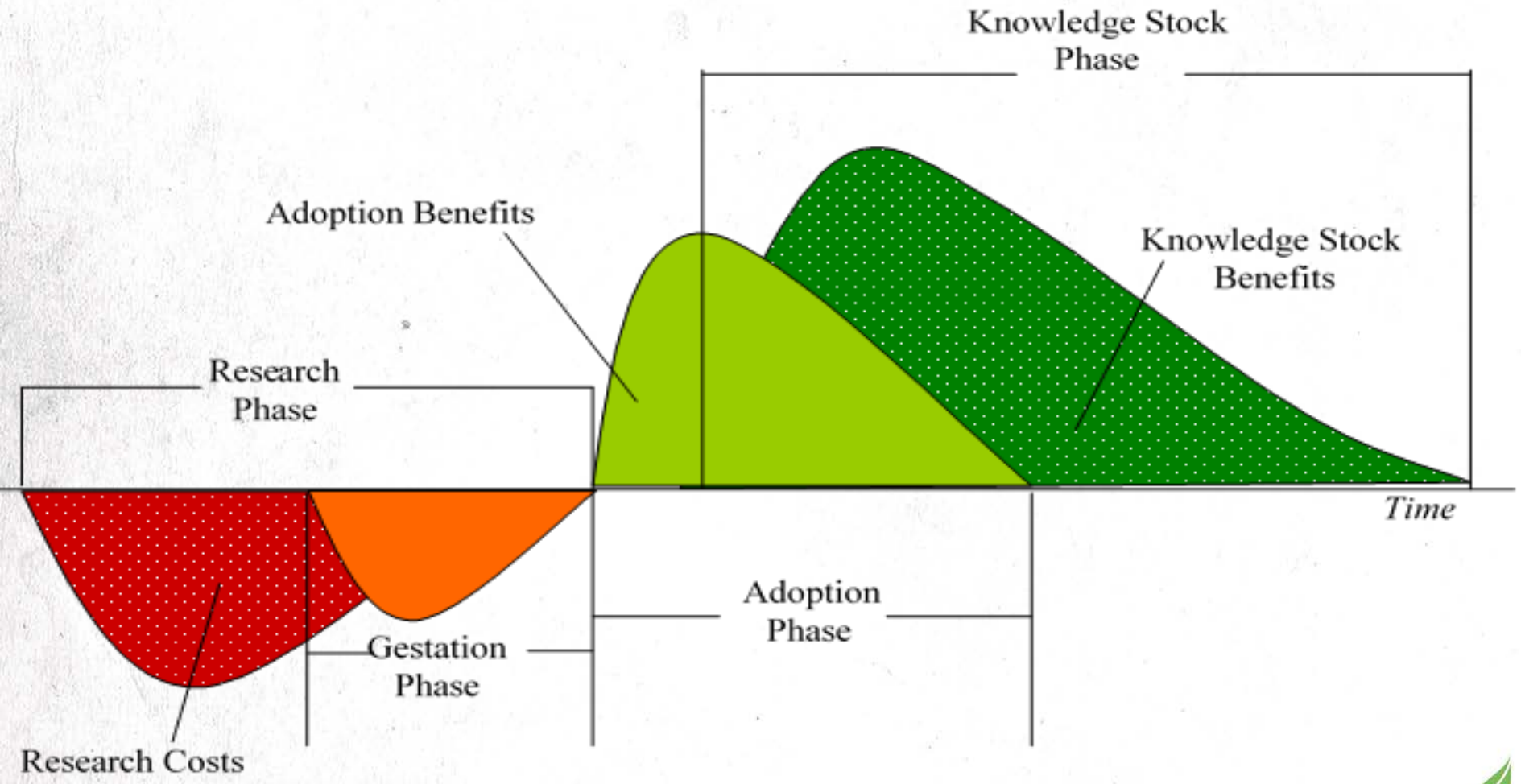
Phases of crop development



Source: adapted from Alston et al., 1995.

Model

- Phillips McDougal (2011) estimated the total cost of all activities required to get a GM crop commercialized require an investment of $136M
- Extended research of Smyth, McDonald & Falck-Zepeda, 2014
- We use this to estimate NPV for an investment of this amount with different ROIs of 20%, 50%, 75% and 100%
- Fixed discount rate of 10%
- 10 year lifespan of the technology applied

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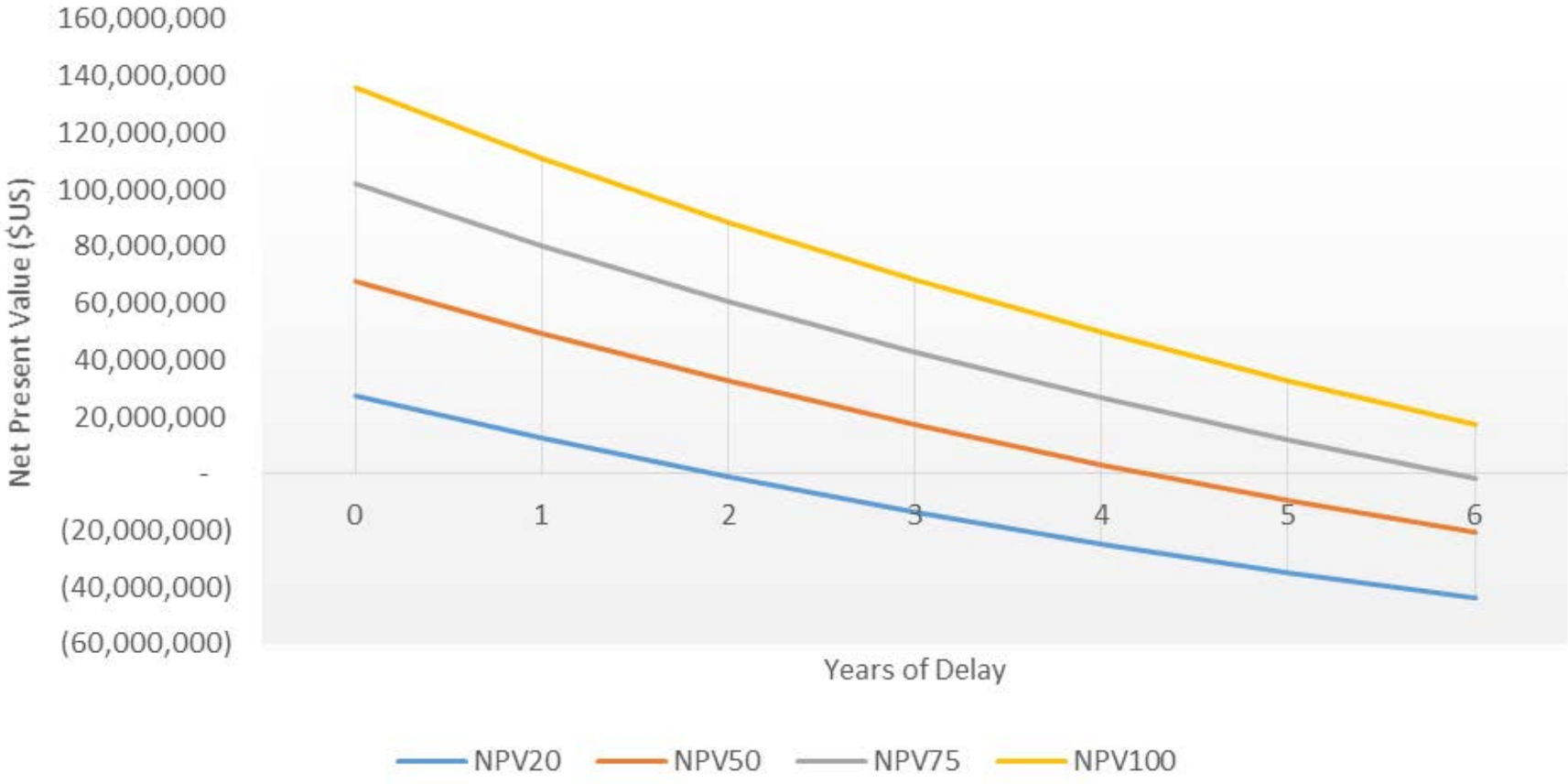
NPV change with regulatory delays



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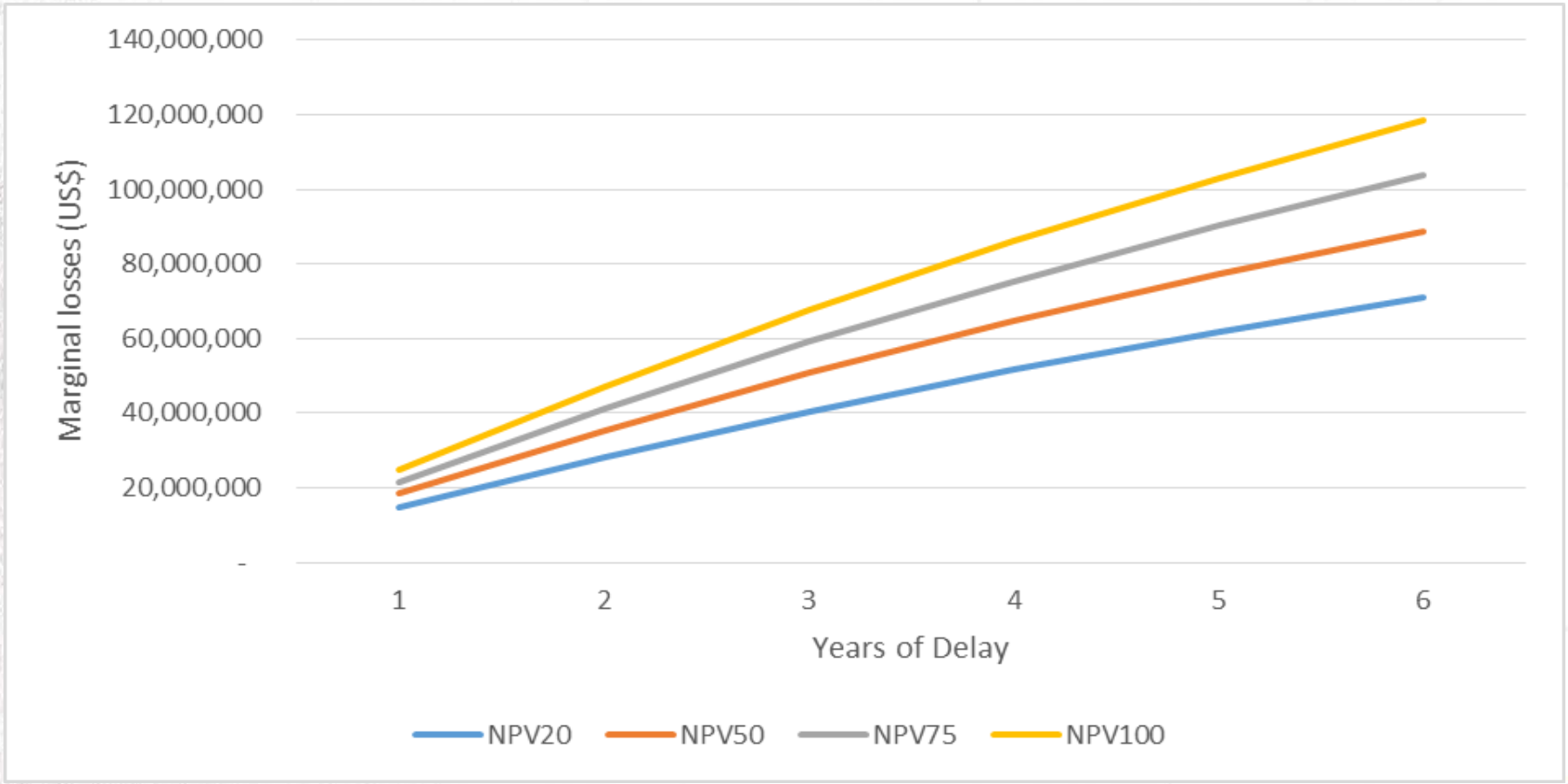
Marginal loss with 10 year life, 10% discount rate



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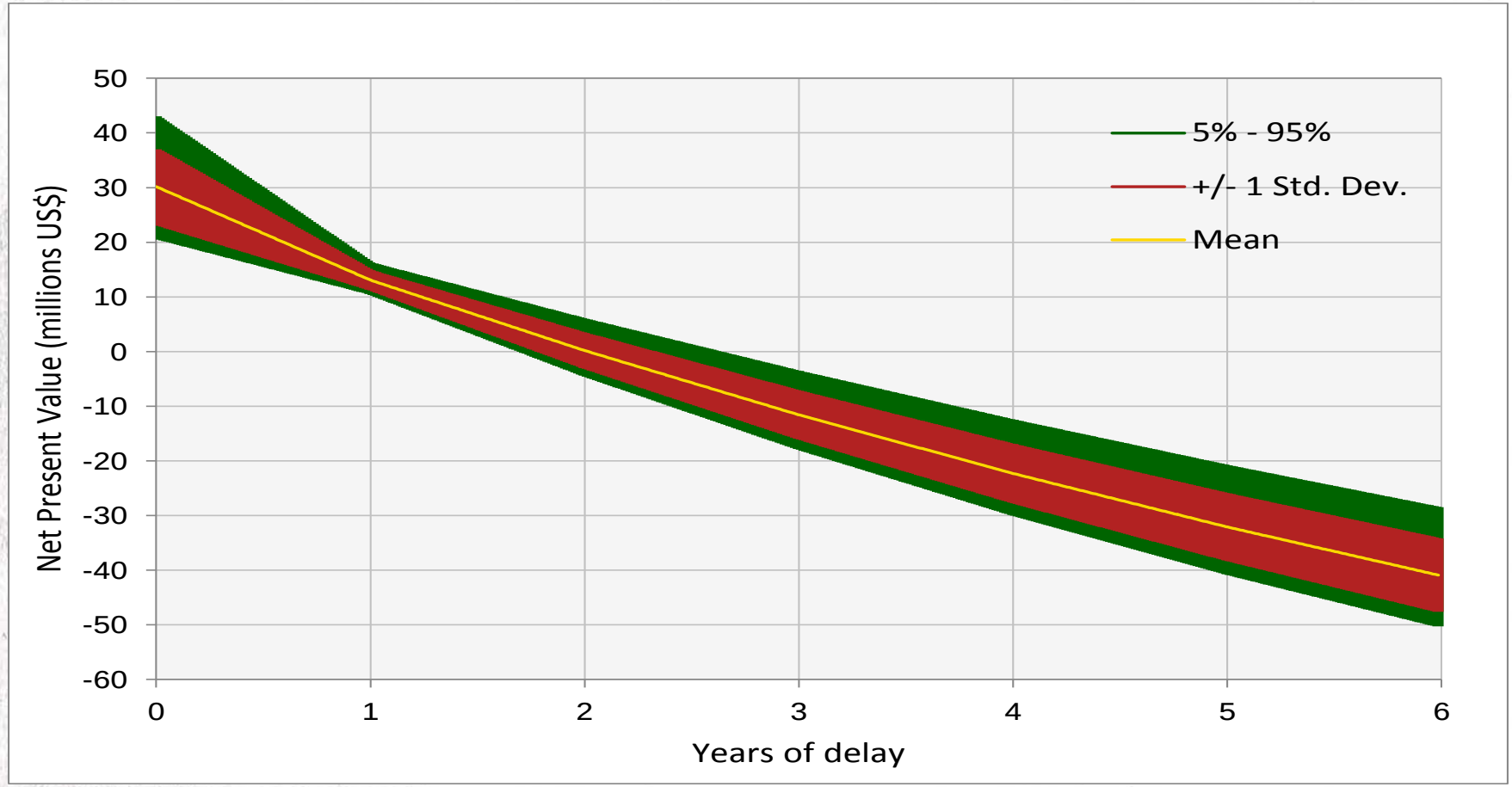
NPV with 20% ROI



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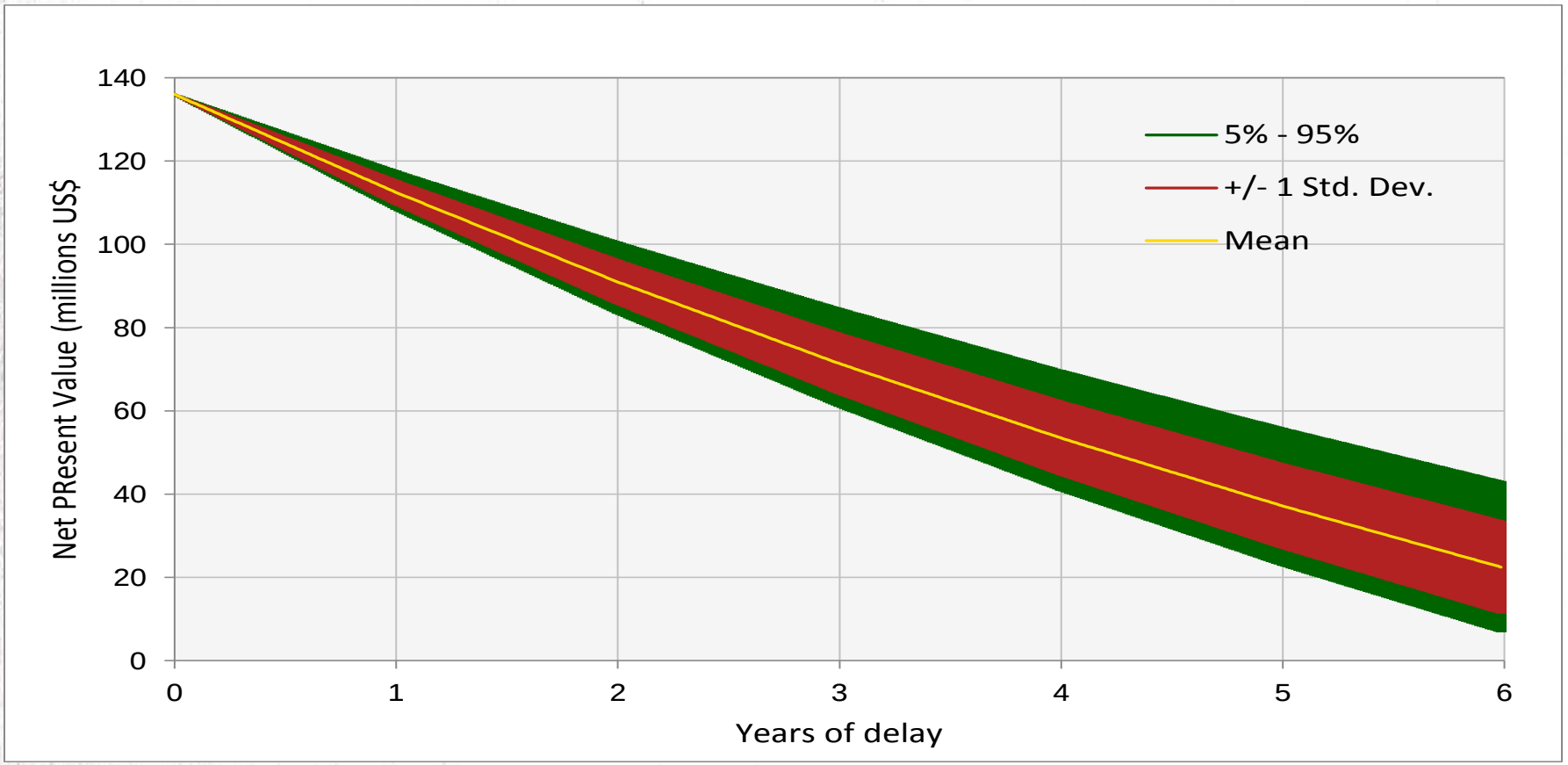
NPV with 100% ROI



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Policy implications

- In most developing countries, public research centers are partnered with international agencies and organizations in the development of new varieties
- These centers will have minimal ROI expectations
- A two-year delay, with a 20% ROI, has been shown to eliminate all positive returns
- Not only is biotech research jeopardized but all agriculture research is in danger of being ended

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Conclusions

- SECs are aggressively being encouraged to become a mandatory part of biosafety regulatory decision-making
- Delays will be even longer for developing nations that lack institutional capacity
- Effects of increasing food security will be devastating

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Questions?
Comments?

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