Getting Carbon Right for Agriculture

Carbon, Bundled Values and Supply Chains

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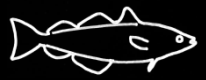
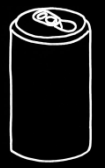
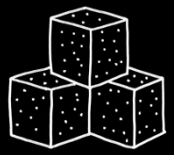
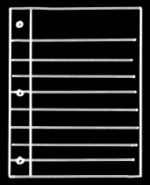
Global Trends—Agriculture and Carbon

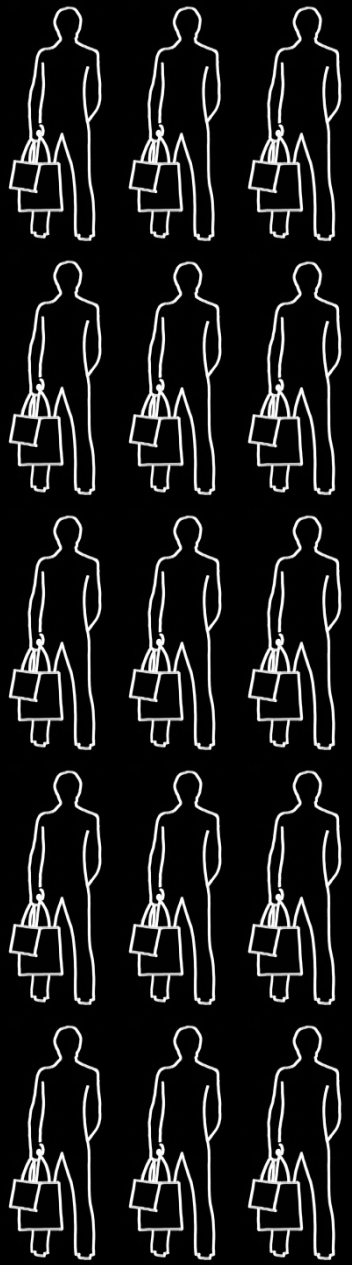
- Tracing Carbon in the Agricultural Supply Chain
  - Tillage, deforestation, livestock, energy use
  - Requiring an input to make a product makes a company “responsible”
- In time of price volatility, if a company pays more for a product what else can it get
  - Can it purchase other values
  - Ensure dedicated suppliers
  - Guarantee access
  - Gain market access or license to operate









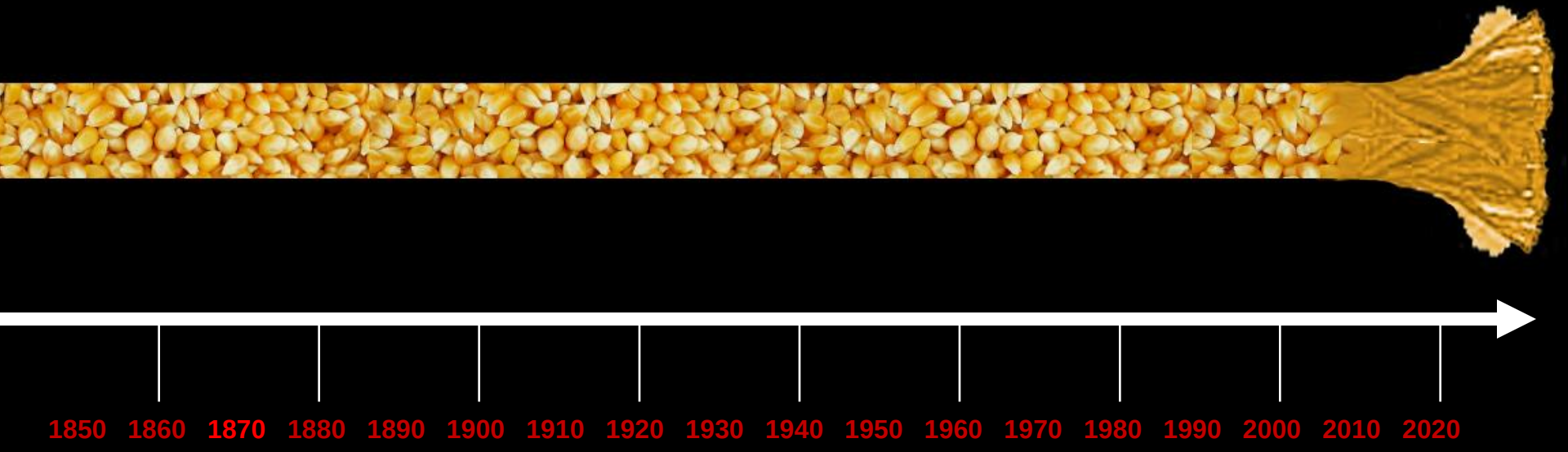



embedded impact

Where Does Carbon Responsibility Begin & End?

- Traceability—if a company knows where a raw material comes from is it responsible for how it is produced?
- If they don't know what does it say about them?
- So, what does a carbon responsible company do?
  - Understand/build consensus around key carbon impacts
  - Target the most significant and work with suppliers to reduce them
  - Agree on methodology to track results
  - Be transparent about targets
- Can commodities deliver carbon values?

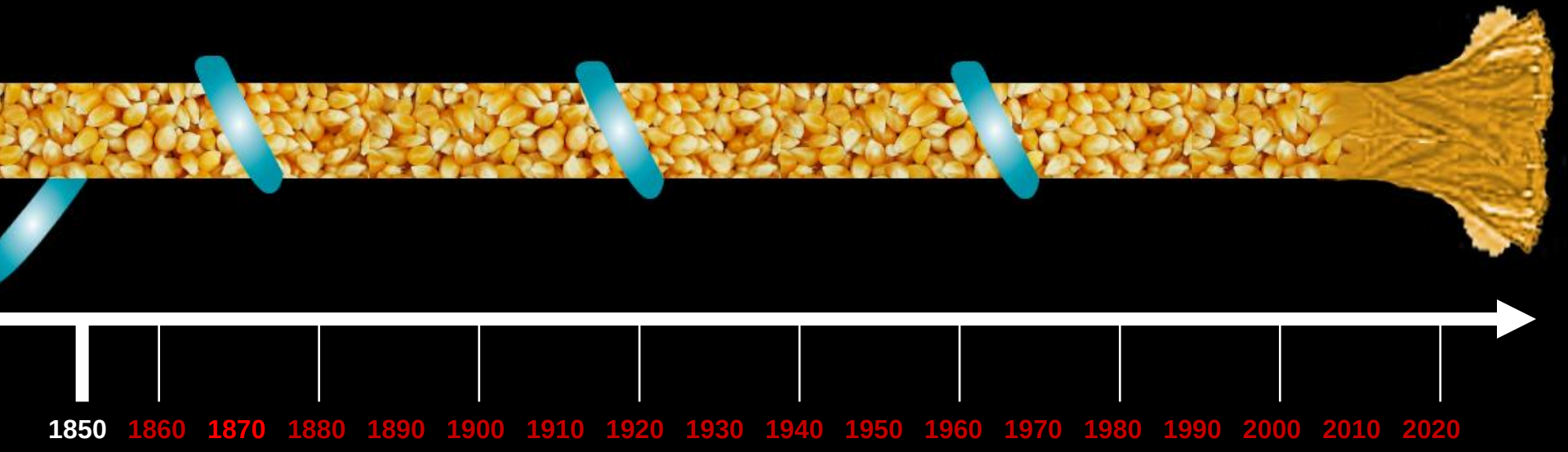
Traditional Supply Chains—What do They Deliver?



1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010 2020

New Value Chains

- Standardized product – 1851



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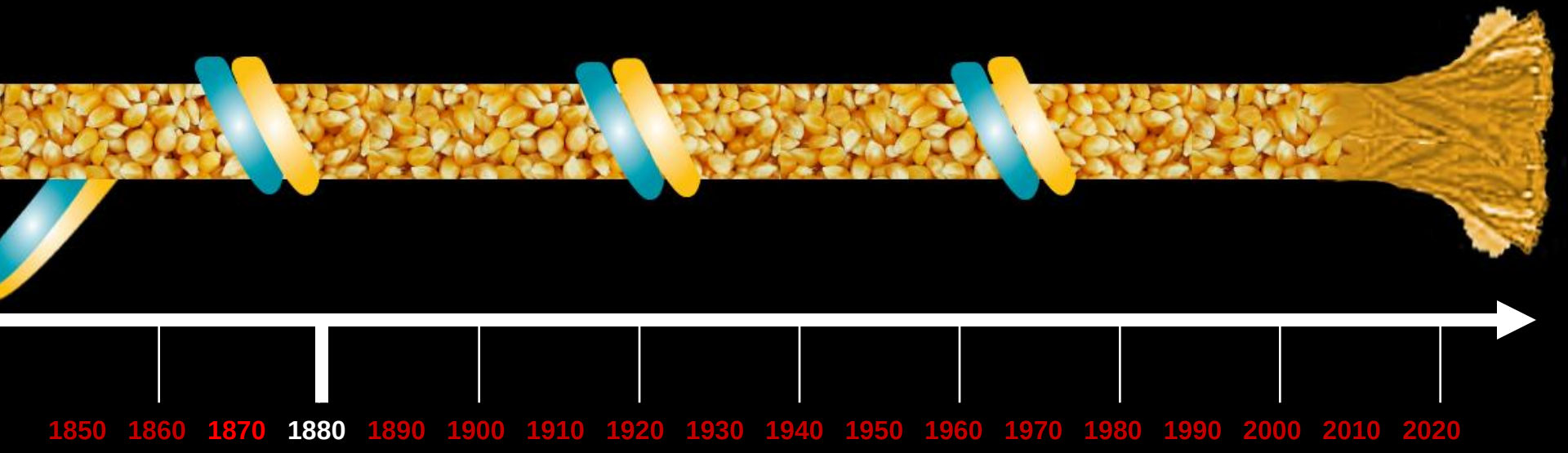
Values Chains

- Standardized products – 1851
- Standards for grain – 1873



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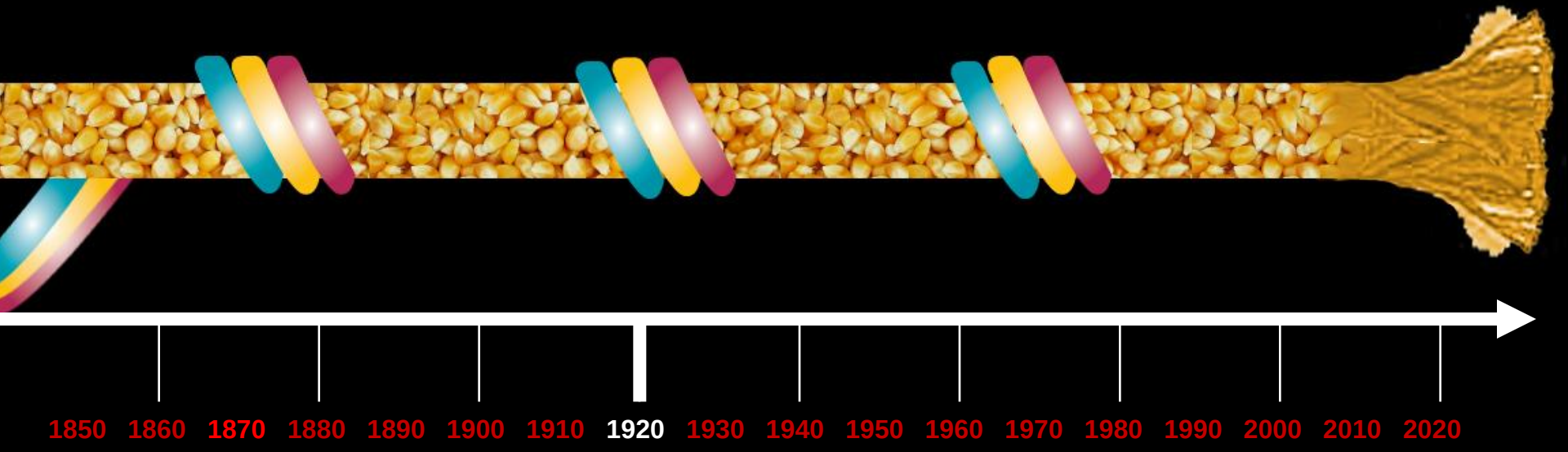
Values Chains

- Standardized product – 1851
- Standards for grain – 1873
- Trade first regulated – 1980s



Values Chains

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- Standards for grain – 1873
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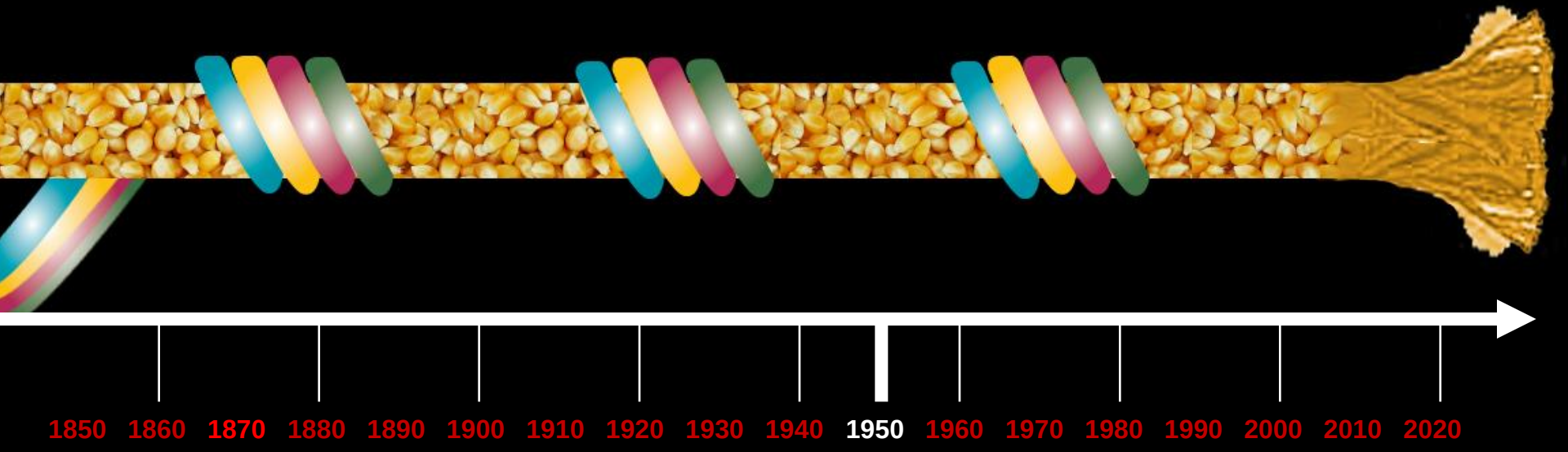
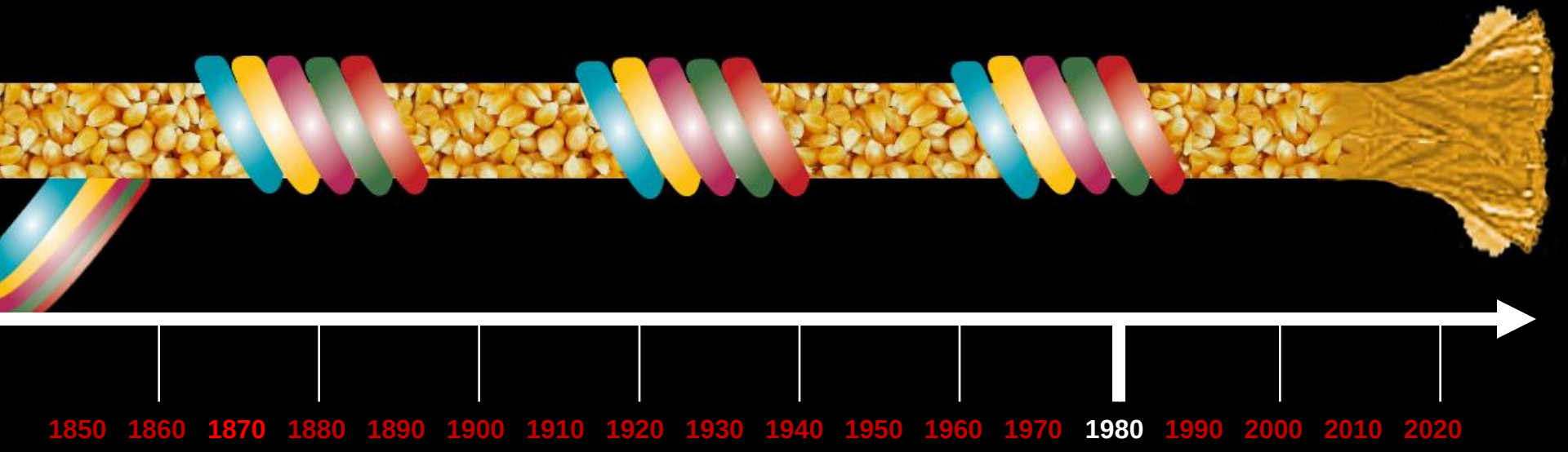
- US Grain Standards – 1916



Values Chains

- Standardized product – 1851
- Standards for grain – 1873
- Trade first regulated – 1880s
- US Grain Standards – 1916
- Bushel weight defined – 1918



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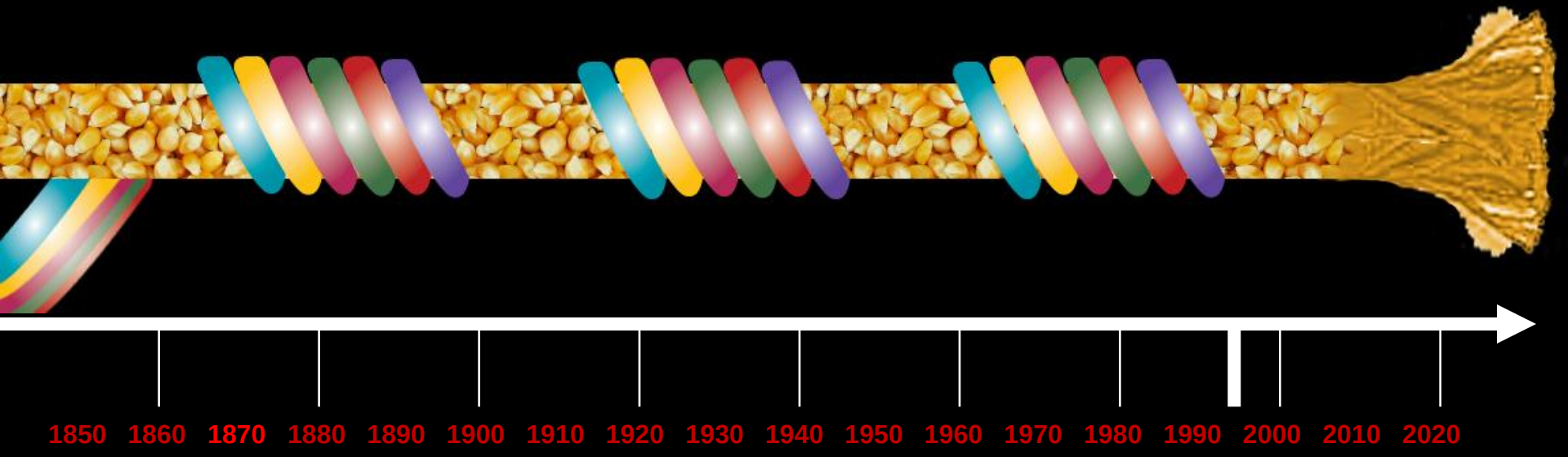

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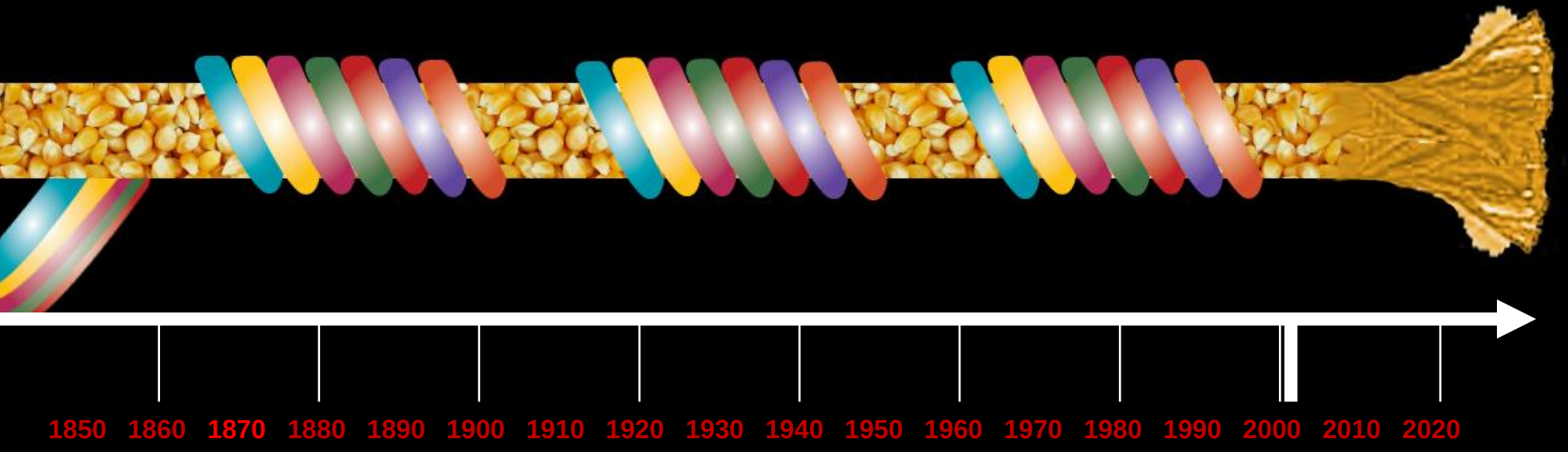
- Organic corn – 1970s



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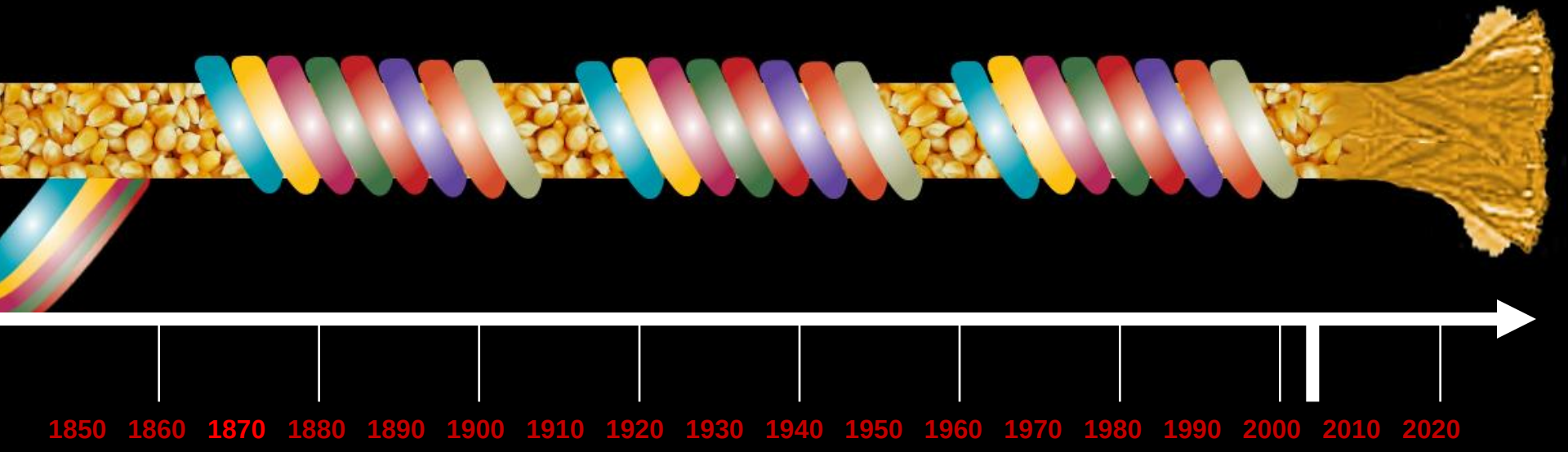
- Organic corn – 1970s
- GM (and non-GM) corn – 1997



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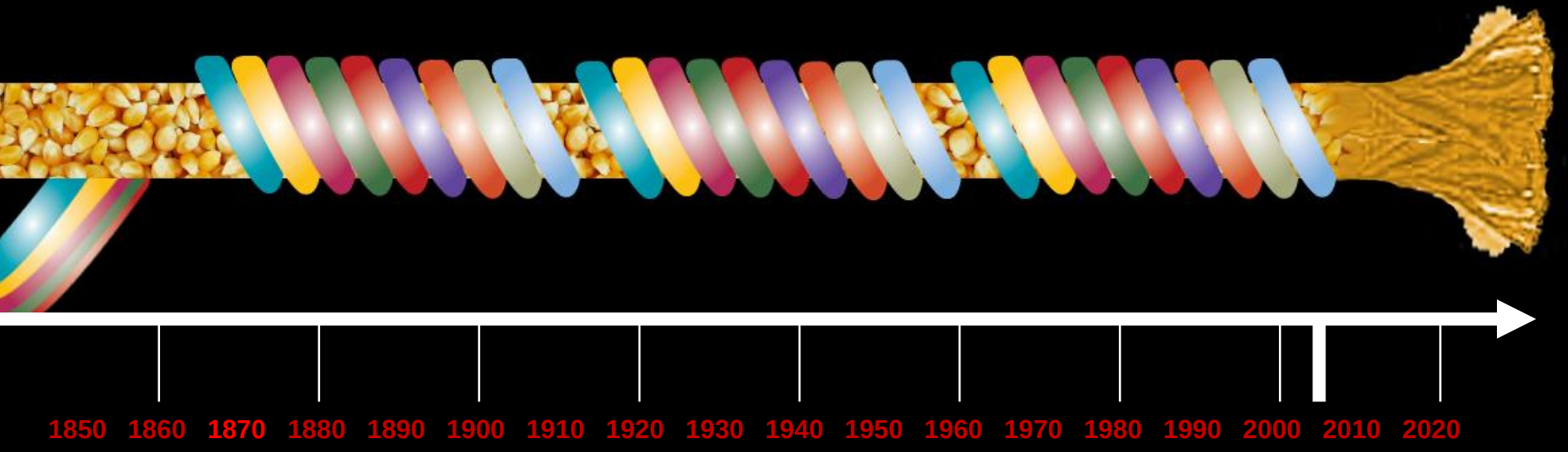
- Organic corn – 1970s
- GM corn – 1997
- Food miles – 2007



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physical values

weights and measures

quality

color

foreign matter

health and safety

intangible/certified values

organic

non-GMO

carbon

water

poverty alleviation

no child labor

Bundled Values Chains

Carbon Sequestration and Bundled Values

- Packaging
- Tree crops, e.g. coffee, tea or palm oil
- Growing soil carbon through no-till, e.g. soy, cotton or corn
- Reduced water use and pumping
- Improved animal diets
- Rehabilitated or reclaimed land with soy, palm oil, meat or dairy
- Bivalve shells and pet food

Coke—Supply Chain Issues and Larger Business Strategies

- Sugar supply in a “perfect storm”
- Locking in sugar purchases (volumes) through contracts
- Higher prices for multiple values
- Using sugar sourcing to address other corporate issues
  - Carbon footprint
  - Water footprint
  - Poverty alleviation
  - Investment strategies

New Services, Old Businesses

- Monsanto
  - Give away the seed
  - Retain the right to the carbon and water saved through no-till
  - Avoided carbon loss through improved yields per input
- Syngenta
  - No loss of natural habitat to agriculture
  - Focus on tropical crops
  - Address climate change issues (water stress, etc.)
  - Rehabilitate degraded lands

New Services, New Businesses

- Mars
  - Substitute oysters and clams from aquaculture for finfish
  - Retain the right to the carbon in the shell (83%)
- Chilean Salmon Producers
  - Produce oyster and clam seed and give to local communities
  - Use clams and oysters to clean the water, reduce stress and mortalities
  - Improve relationships with neighbors
  - Retain the rights to the carbon in the shell to offset food miles

New Services, New Businesses, Joint Ventures

DuPont

- Sulfuric acid
- GHG service
- Waste to Product

Yara

- Nitrogen
- GHG service
- Waste to product
- Poultry

New Services, New Businesses, Joint Ventures

Cargill and Sime Darby

- Peat Soils
- Existing Plantations
- New Plantations
- Land tenure/business models

Public Entities

- Peat Swamps
- Avoided Carbon Loss
- Concessions or Carbon

Verification and Credibility Issues

- Traditional models—chain of custody, full traceability, mixed product
- New models—Green Energy
- Book and Claim Advantages
  - “Value” to producers
  - Simplicity of system
  - Reduced points of fraud
  - Consumer education needed