STEWARDSHIP PRACTICES REQUIRED IN THE PRODUCTION OF VALUE-ADDED SOYBEANS

John Dodson
President, American Soybean Association

Some definitions:

- Historical examples of successful identity-preserved (IP) crop production systems.
- Commodity crop handling.
- IP systems for soybeans.
- IP soybeans for soyfoods and soy protein ingredients.
- Value-added soybean traits and future likely market developments.

DEFINITION (1): **Stewardship Practices / System**

Separation for special treatment, of individuals or items from a larger group; so as to deliver higher-valued subset to end markets.

*** U.S. farmers have long separated-out and delivered higher-valued subsets of products (food-variety specialty soybeans, certified Angus steers, etc.).**

When applied to crops: Separation of different varieties (e.g., certified seed production, food-specific varieties of soybeans, etc.) through end point of delivery.

Sometimes called: **Identity Preservation (IP)**

DEFINITION (2): **Identity Preservation (IP)**

- To *preserve the identity* of something (through end delivery).
- The tolerance for mix-in; is either identity specific, or trait/ property specific.

When applied to crops:

- Separate production and delivery to market, according to an *agreed standard*, and with an *agreed tolerance level.*
- Requires that a price premium be paid, to compensate for the extra effort and infrastructure required.

What happens in practice?

- *Identity Preservation* systems are operational in U.S. and some other countries. Some examples:
  - System related: *Organic soybeans*
  - Property related: *HO- Sunflower seeds*
  - Commodity crop transition: *00-Rapeseed*
- To be contrasted with ***Commodity crop*** handling
  - *e.g., US Yellow Soybeans Grade 2*

High Oleic (HO) Sunflower IP (1)

- Market scale: a few 100,000 MT/yr. world-wide
- High Oleic sunflower seed is a niche market product grown on contract base : Pioneer Olbaril™, Trisun™ and other HO-sunflower seed varieties obtained by “old” biotechnology.
- Separately harvested, collected and crushed.
- Fatty Acid analysis as fast control tool (NIR?)
- Price premium significant (> 100 % on final product)
- Tolerance ≤ 5%; not variety, but HO **property** related!

HO-Sunflower seed IP (2)

Quality Losses as Oleic acid content:

data provided by Optimum™ OPTIMUM QUALITY GRAINS, LLC	oleic acid content	commingling loss
Pioneer Olbaril seeds	91-92%	1 to 2 %
ex Field	87-88%	4 to 5 %
ex Crush	86%	6 %
ex Refinery	82-84%	9 to 10 %

HO-Sunflower seed IP (3)

List of potential factors that might contaminate the crop

= > First hurdle: Cleanliness of the planter

= > Cleanliness of the combine harvester

= > Management of the trucks/bins (wagons)

= > Trucks/bins reception at the silos

= > Cleaning and Drying process

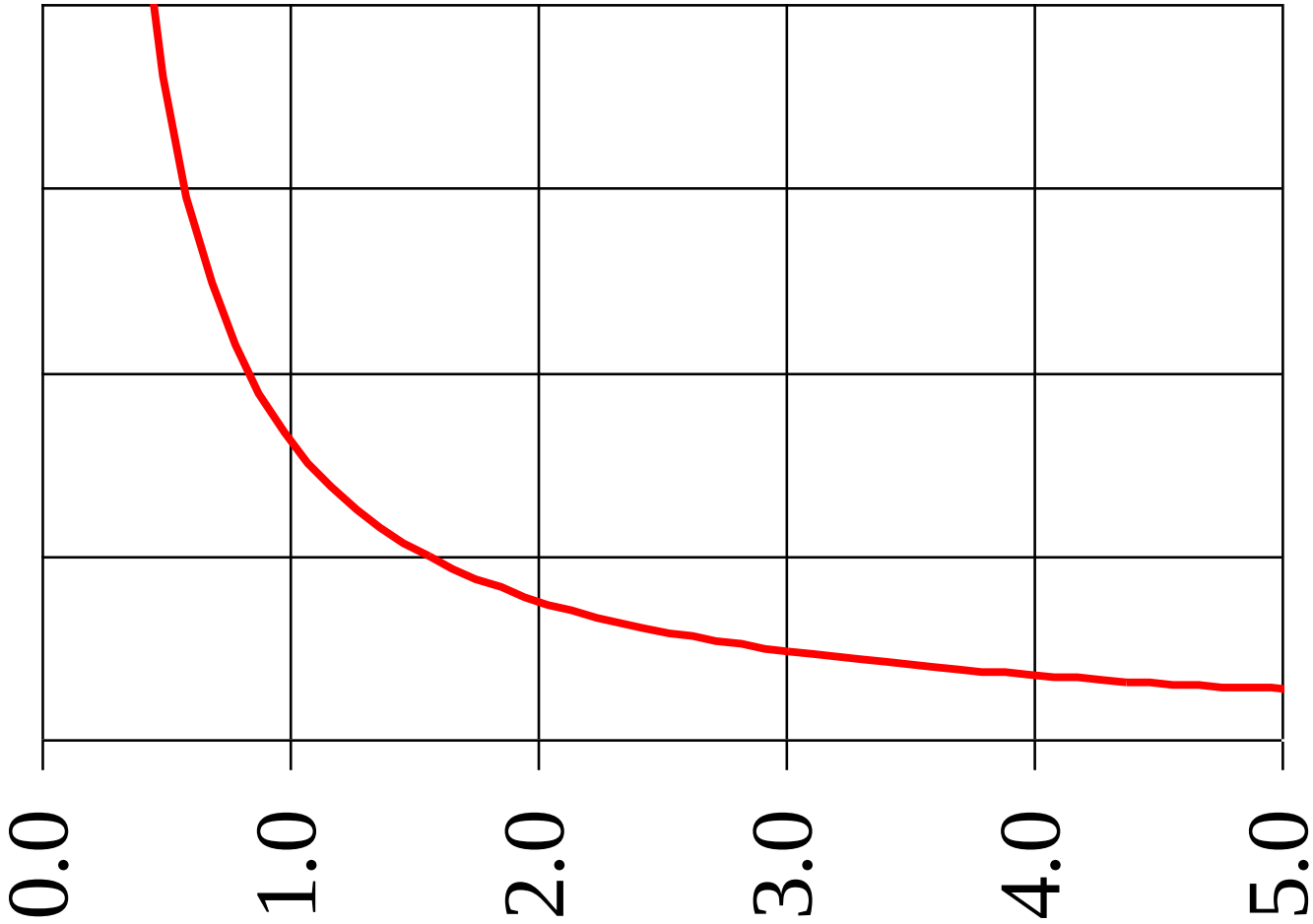
= > Loading/Unloading operations

⇒ Crushing/processing operations

Summary: Some IP System #s

	premium over commodity level	purity level
Organic soybeans	100 to 300 %	95 to 98 %
Waxy corn	15 to 20 %	> 92 %
HO Sunflower based seed/oil	5 to 15 %	75 to 95 %
Corn for dry milling	3 %	60 to 80 %
00 Rapeseed (transit.per.only)	> 5 %	>90 %

IP Premium vs. Tolerance level: an exponential relationship



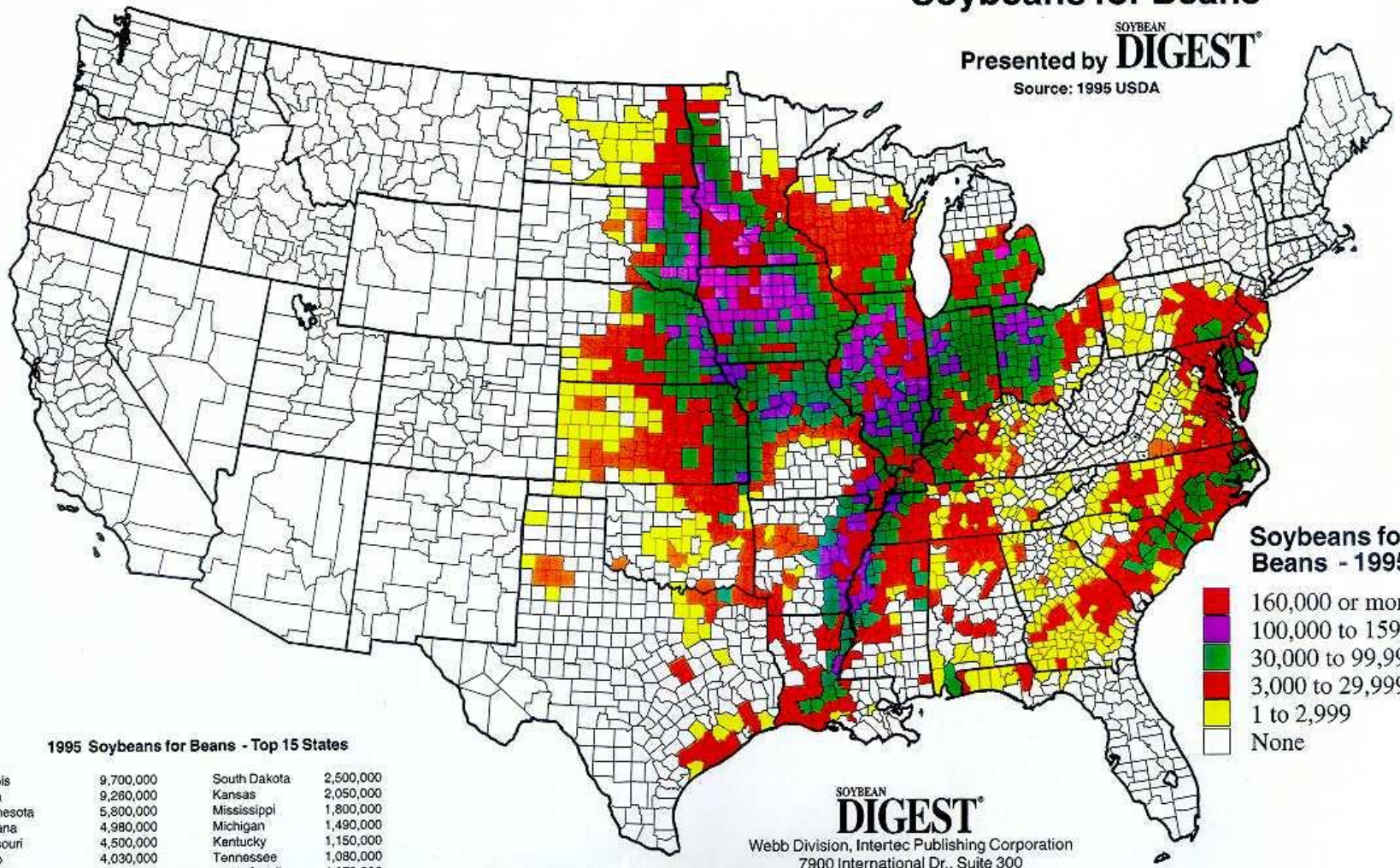
U.S. No. 2 Soybeans – has long been a Commodity Crop Production System

- US production: approximately 80 million MT annually (world: 220 million MT)
- Traded on CBoT and world commodity exchanges on very basic quality criteria (Grade 1, 2 etc.)
- Approx. 450,000 U.S. farms / 30 million ha / 29 States
- Conditions and varieties differing from South to North, and from East to West: > 1,600 ***approved*** varieties (incl. ± 1,300 RR soybean varieties)

Soybeans for Beans

Presented by SOYBEAN DIGEST®

Source: 1995 USDA



1995 Soybeans for Beans - Top 15 States

Illinois	9,700,000	South Dakota	2,500,000
Iowa	9,260,000	Kansas	2,050,000
Minnesota	5,800,000	Mississippi	1,800,000
Indiana	4,980,000	Michigan	1,490,000
Missouri	4,500,000	Kentucky	1,150,000
Ohio	4,030,000	Tennessee	1,080,000
Arkansas	3,400,000	North Carolina	1,070,000
Nebraska	3,060,000	***TOTAL U.S.***	***61,624,000***

SOYBEAN DIGEST®
Webb Division, Intertec Publishing Corporation
7900 International Dr., Suite 300
Minneapolis, MN 55425
612-851-4698

U.S. Yellow Soybeans Grade 2

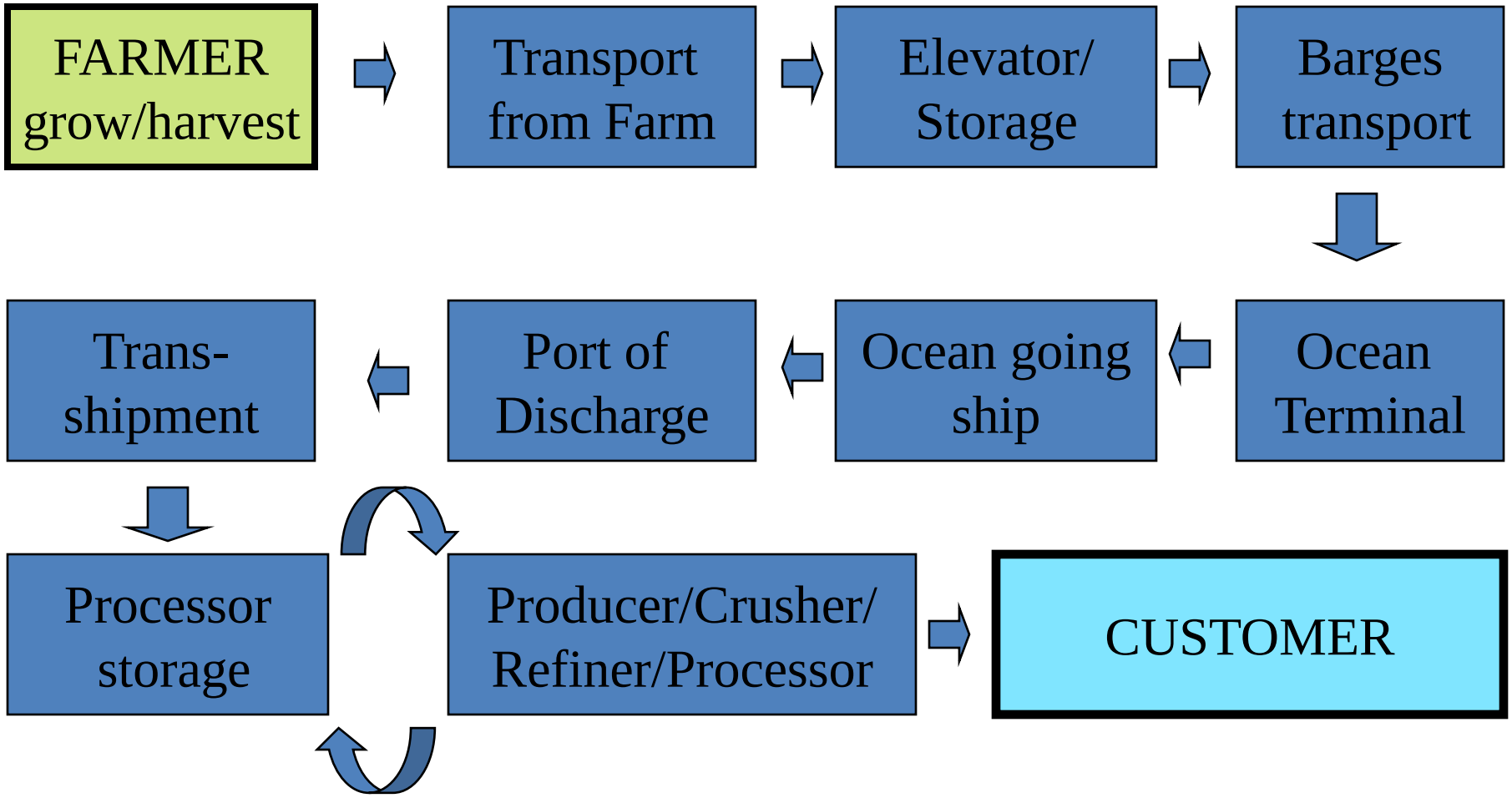
Summary of Export Quality Requirements (USDA)

Factor	Limit	N (*)	Avg	Min	Max
Test weight (Lb/Bu)	min 54	996	56.2	54.1	58.1
Test weight (kg/hl)	N/A	996	72.4	69.7	74.8
Moisture (%)	N/A	996	12.2	9.8	14.0
Damaged kernels (%)	max 3	996	1.1	0.0	2.9
Foreign material (%)	**max 2**	996	**1.7**	**0.0**	**2.0**
Splits	max 20	996	7.5	0.1	16.2
With other color	max 2	996	0.0	0.0	0.3
Protein (13 % moisture)		555	35.1	33.0	37.7
Oil (13 % moisture)		560	18.5	16.9	20.0

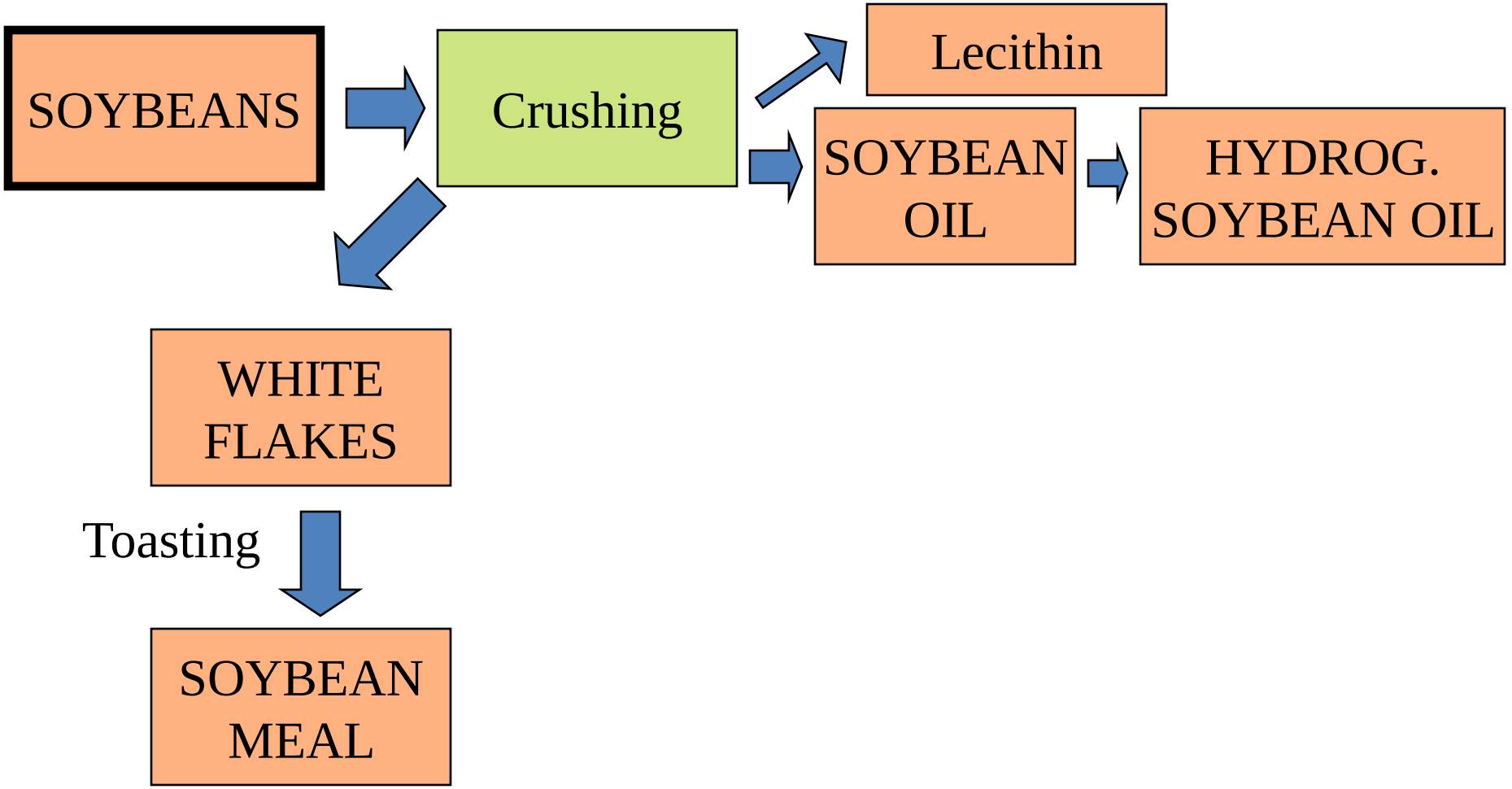
(*) 996 of 1074 lots = 22.3 MMT (= 94%)

US No. 2 Soybeans - from Farm to Plate

Commodity soybean handling



Commodity soybean crushing (1)



Speciality soybeans today (IP)

Existing specialities

- Clear hylum soybeans for soybean milk (US; Asia)
- High protein soybeans for tofu production (US; Asia)
- High sucrose soybeans for speciality soyfoods
- Organic soybeans

Genetically improved crops with value-added traits

- HO-soybeans (DuPont™)

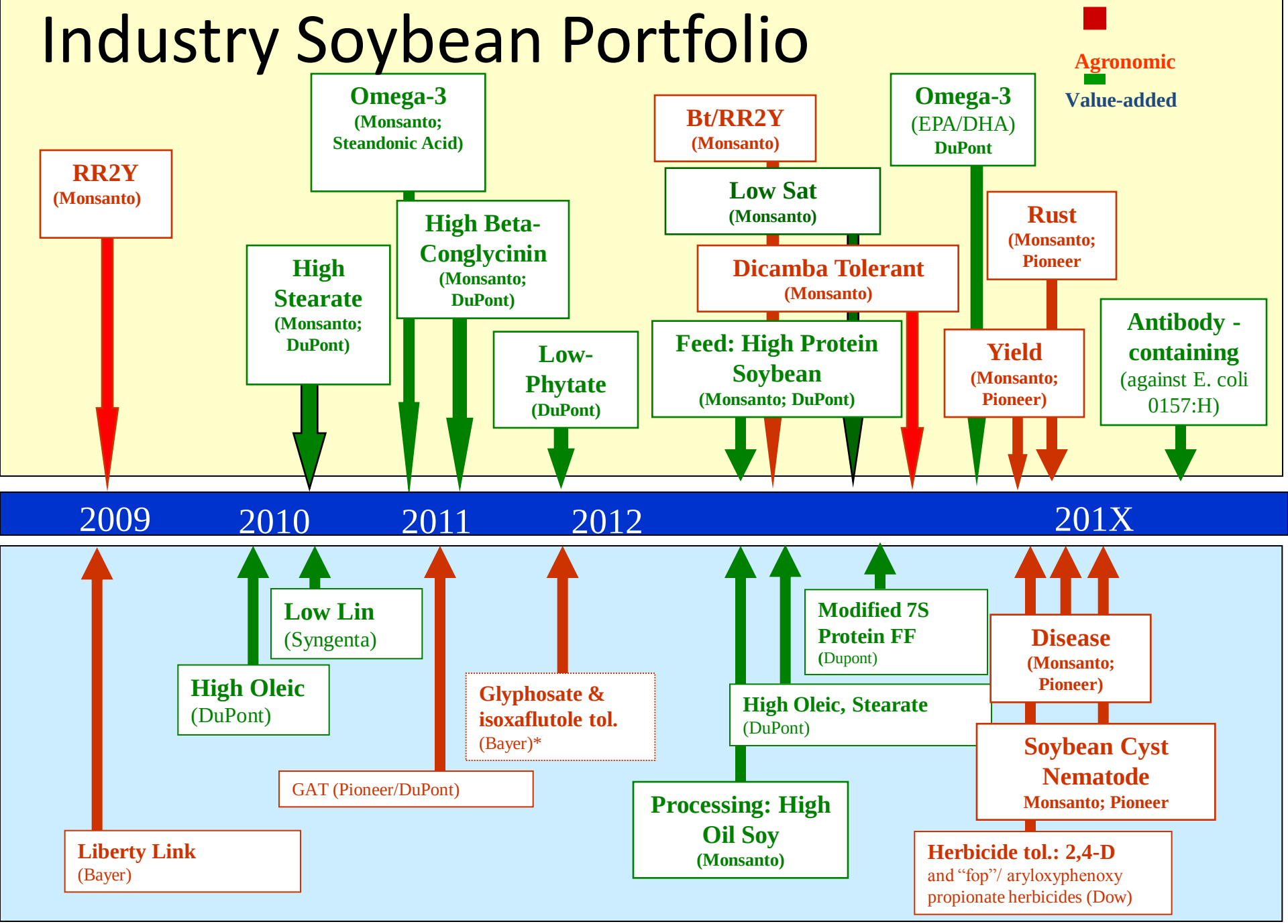
  To be commercialized in U.S. in 2010.

- High-stearate soybeans

  To be commercialized in U.S. in 2010.

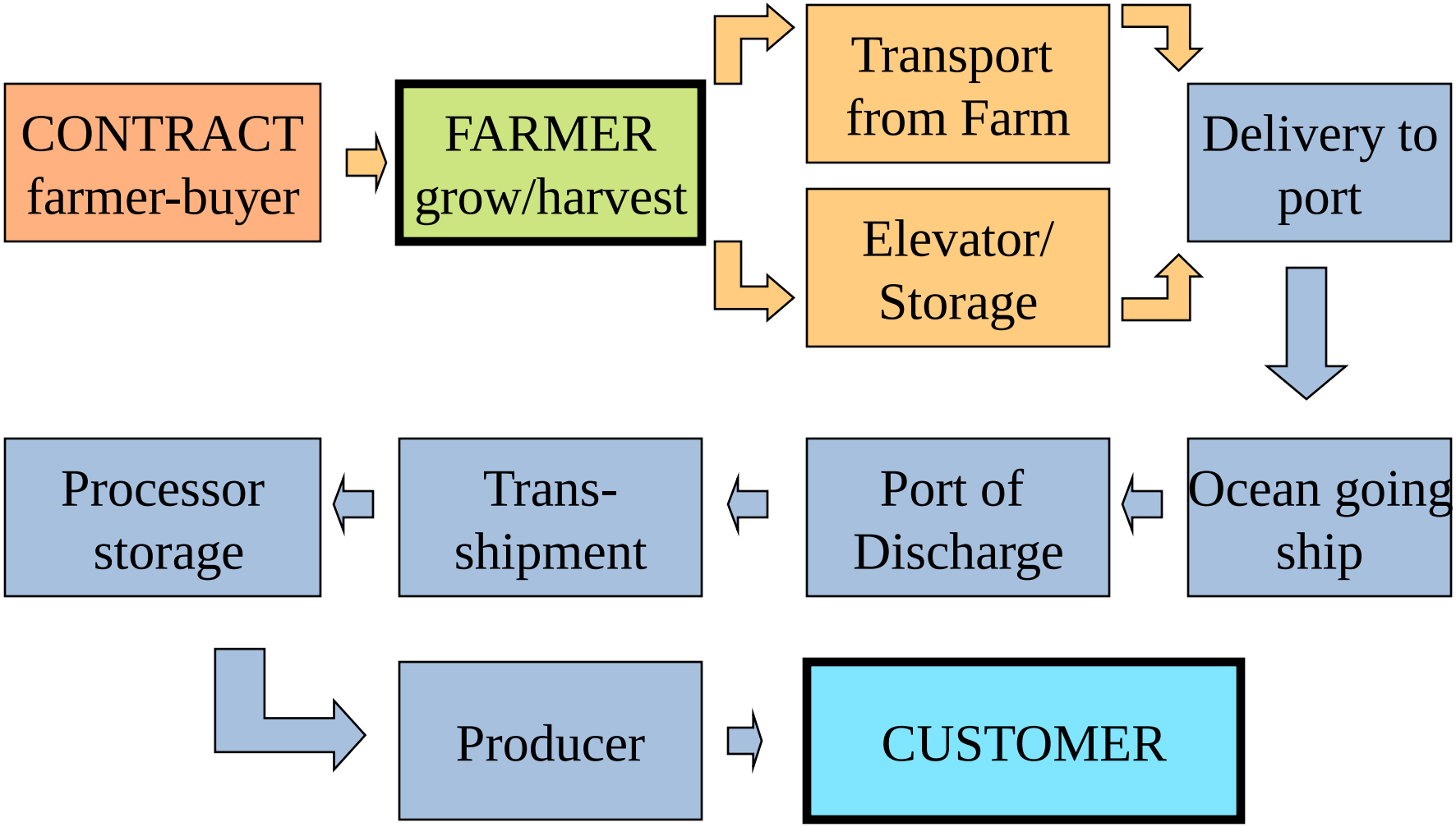
  ** Numerous other additional new value-added soybeans to be commercialized after 2010, depicted in GREEN COLOR on following slide; will be “stacked” with the herb./pest traits in RED.

Industry Soybean Portfolio



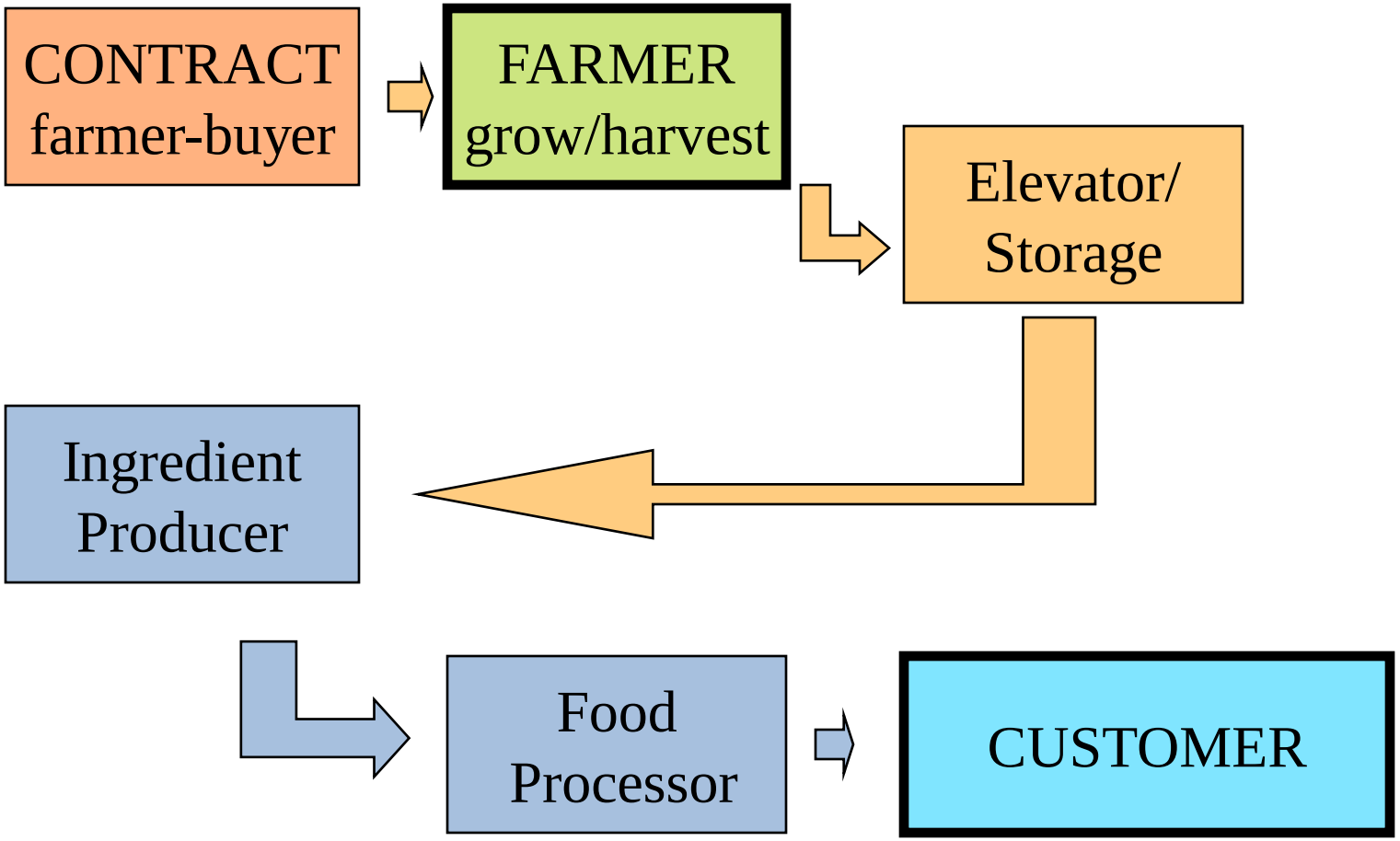
US Soybeans - from Farm to Plate

IP Soybean handling

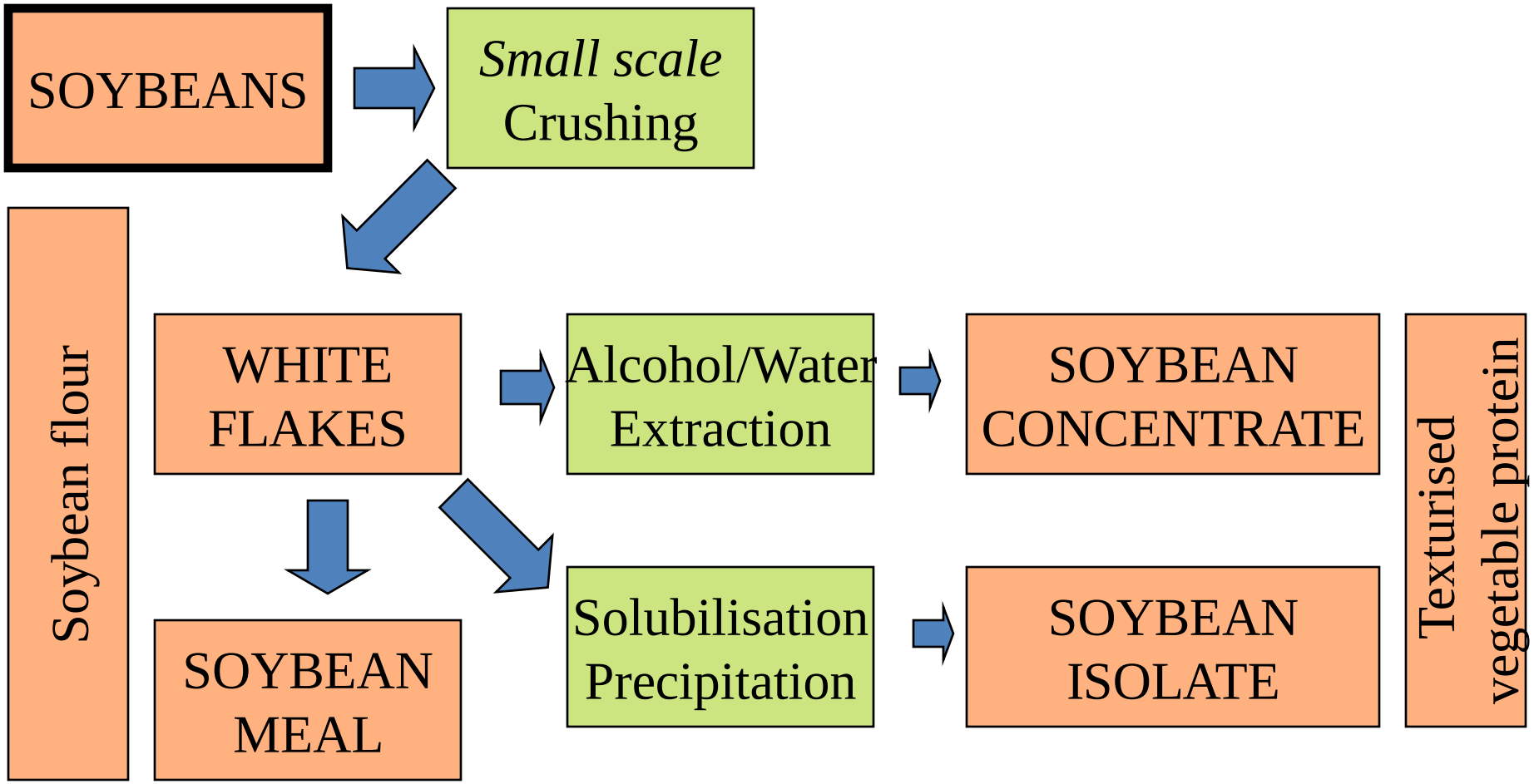


US Soybeans - from Farm to Plate

IP Soy Protein Ingredients production



Soy Protein Ingredients Production



Value-added Soybean Variety Release for U.S. Commercialization

- Biotechnology-derived varieties are only commercialized after receiving required overseas import approvals (we realize you want to be able to sell your products derived from our soybeans everywhere).
- If the product is not *substantially equivalent* (i.e., the essence of value-added), then most countries' laws require labelling as to the property (e.g., higher oleic).
- Of course, food manufacturers would generally want to thus label the product; to highlight its superior health benefits, etc.