

An Overview of Biobased Products That Reduce or Replace Fossil Fuel Feedstocks And Where To Find Them

a presentation to *Energy 2004*

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Presented Aug. 10, 2004 at Rochester NY Riverside Convention Center



BMA Mission:

To promote excellence in the manufacture, sale and use of biobased products and the responsible development of renewable resources.

BIOBASED[™]
Manufacturers Association

BMA Functions:

- ✦ An affordable e-commerce site for marketing member products on purchasing feedstocks
- ✦ A national standards credential service.
- ✦ A national information clearing house and networking portal for stakeholders.
- ✦ A single voice to gather input and represent the interests of biobased manufacturers in government policy and regulation.
- ✦ A media relations agent for members



What is a biobased product?

- ✦ Relies on plant or animal materials as the main ingredient.
- ✦ The plants or animals utilized are a renewable resource.
- ✦ With some exceptions, generally do not contain synthetics, toxins or environmentally damaging substances.



Biobased products fall into three broad categories:

- ✦ **Biofuels**
- ✦ **Biochemicals**
- ✦ **Biomaterials**

Biofuels Subclasses:

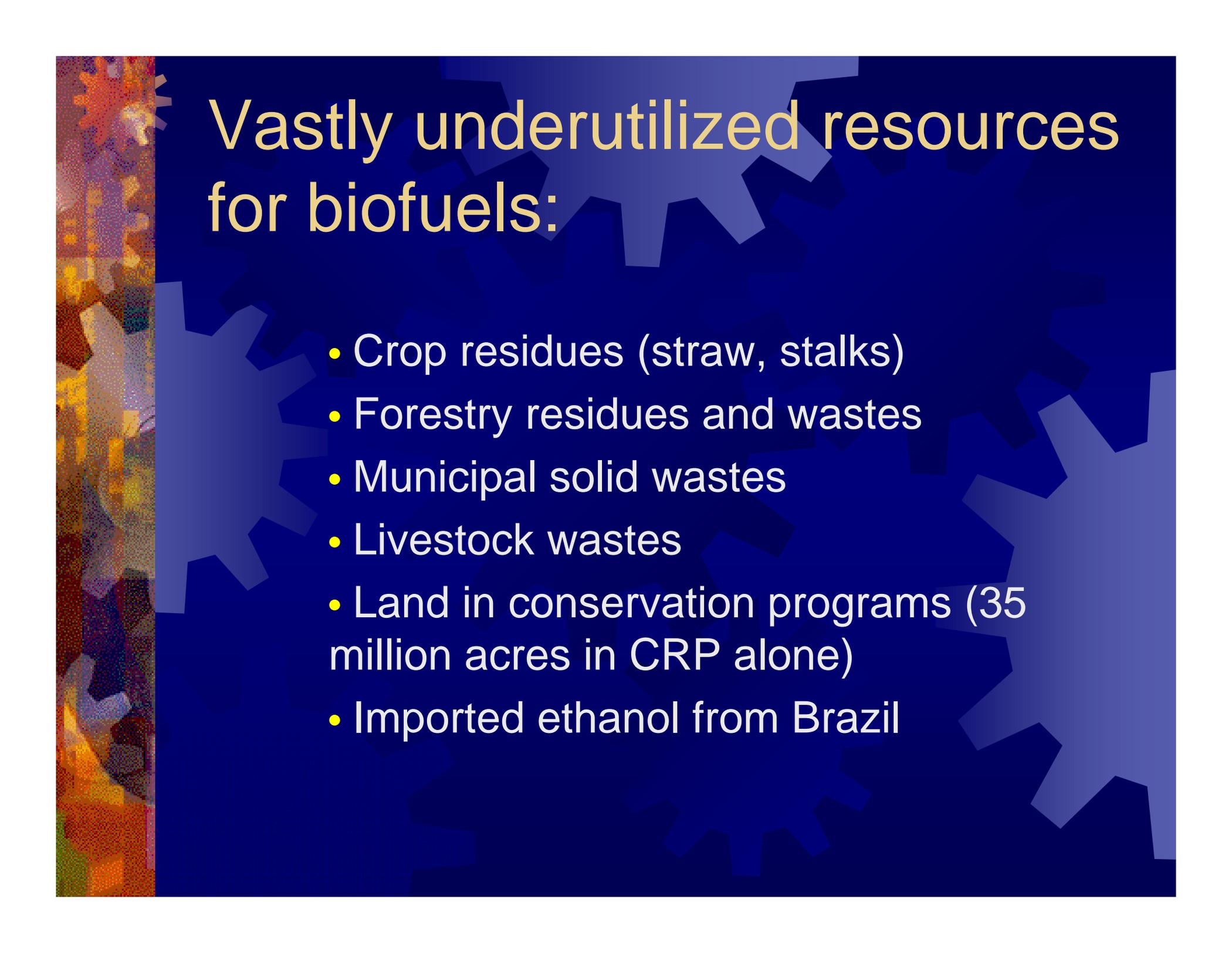
- ✦ Ethanol
- ✦ Biodiesel
- ✦ Fuel additives
- ✦ Biogas
- ✦ Biomass
- ✦ Wind/solar/geothermal



The 15% solution to dependence on Mideast Oil:

The U.S. imports 60% of the oil it uses.
But only 25% comes from the Mideast.
25% of 60% is 15%.

So if we could replace just 15% of our current oil consumption through biofuels and conservation, we wouldn't need Mideastern oil at all!



Vastly underutilized resources for biofuels:

- Crop residues (straw, stalks)
- Forestry residues and wastes
- Municipal solid wastes
- Livestock wastes
- Land in conservation programs (35 million acres in CRP alone)
- Imported ethanol from Brazil

Biochemical Subclasses:

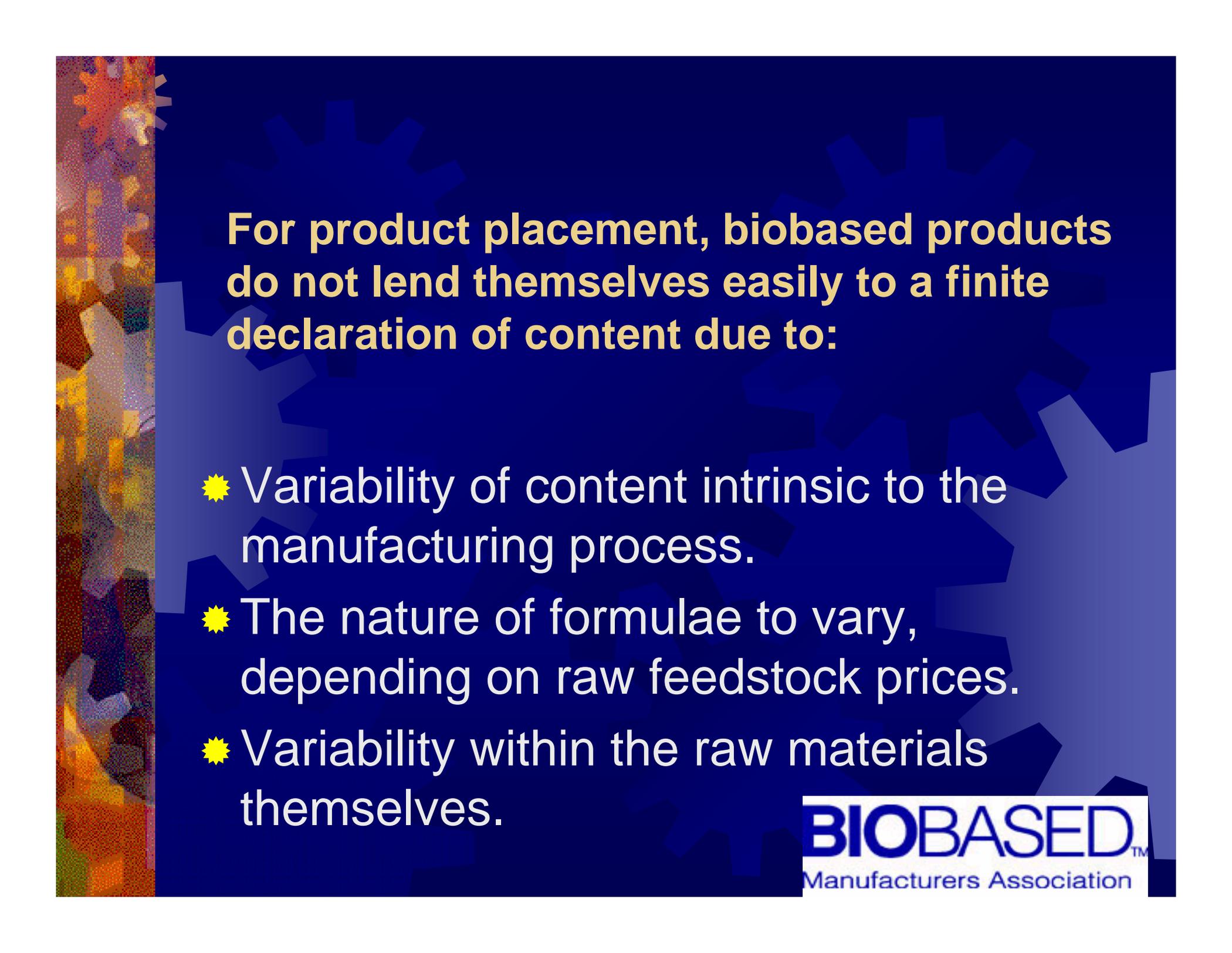
- ✦ Absorbents/Adsorbents
- ✦ Activated carbon
- ✦ Adhesives
- ✦ Ag chemicals, Adjuvants
- ✦ Surfactants, soaps, detergents
- ✦ Gases and vapor technologies
- ✦ Inks, dyes, paints, pigments, coatings
- ✦ Lubricants, rust inhibitors
- ✦ Functional fluids
- ✦ Industrial oils, waxes, binders
- ✦ Cleaners, solvents, co-solvents
- ✦ Specialty chemicals
- ✦ Fatty acids, acetic acids
- ✦ Water & wastewater treatment

Biomaterial subclasses:

- ✦ Construction and building materials
- ✦ Fertilizers and compost
- ✦ Fibers, textiles, carpets
- ✦ Furnishings, housewares
- ✦ Foods, beverages, nutrients
- ✦ Livestock & pet food ingredients
- ✦ Paper and paper products
- ✦ Plastic bags, liners & covers
- ✦ Plastic cups, dishes, utensils
- ✦ Plastic weed barriers, bale wraps, etc.
- ✦ Molded plastics and packaging
- ✦ Landscaping and soil remediation
- ✦ Soil amenders, dust suppressants, etc.
- ✦ Personal consumer products
- ✦ Pharmaceuticals, nutraceuticals

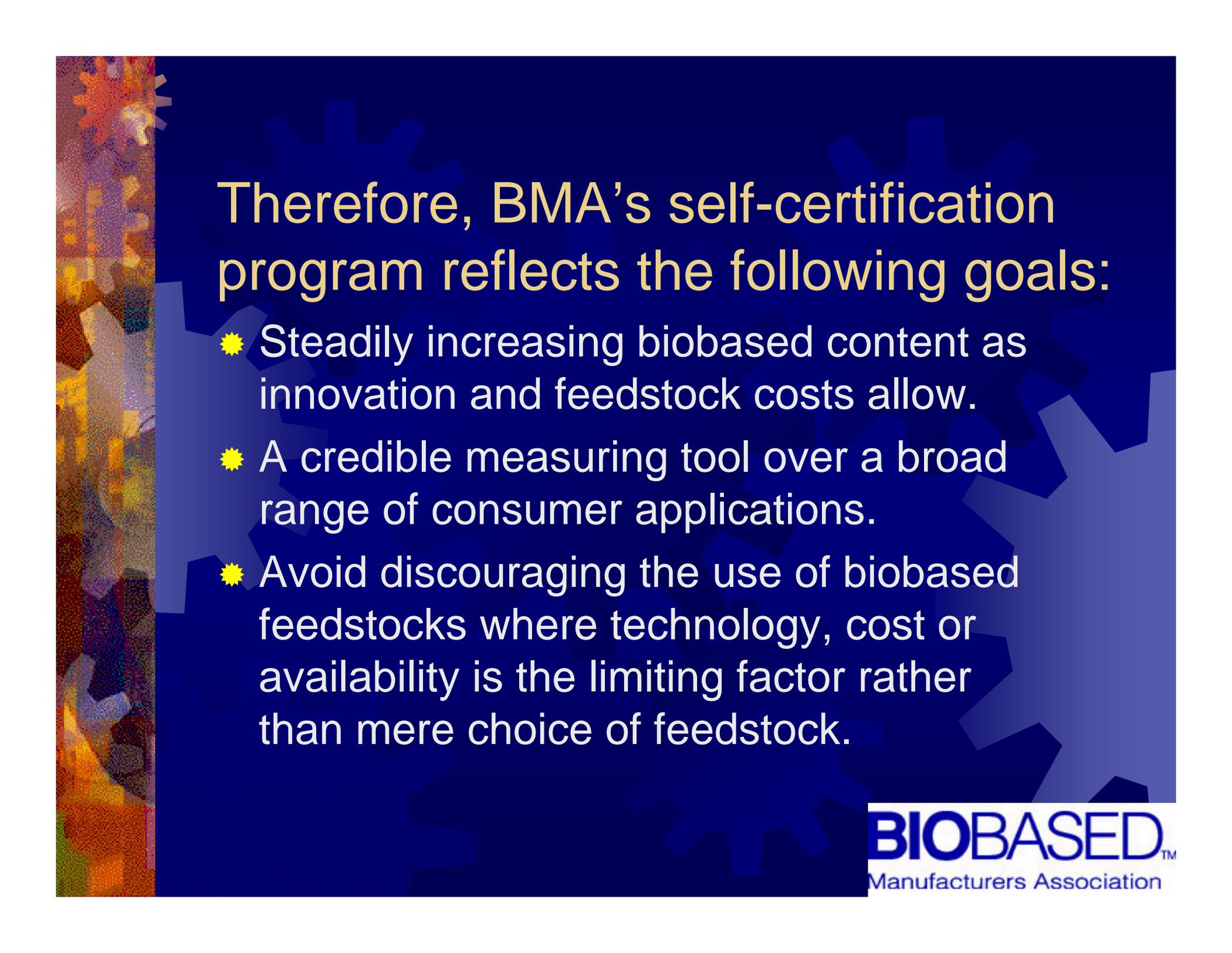
For general compliance statements, marketing literature, and other public disclosure apart from product placement BMA promotes this seal:





For product placement, biobased products do not lend themselves easily to a finite declaration of content due to:

- ✦ Variability of content intrinsic to the manufacturing process.
- ✦ The nature of formulae to vary, depending on raw feedstock prices.
- ✦ Variability within the raw materials themselves.



Therefore, BMA's self-certification program reflects the following goals:

- ✦ Steadily increasing biobased content as innovation and feedstock costs allow.
- ✦ A credible measuring tool over a broad range of consumer applications.
- ✦ Avoid discouraging the use of biobased feedstocks where technology, cost or availability is the limiting factor rather than mere choice of feedstock.

**BMA authorized seal for
self-certified product placement:**

15% minimum content

35% maximum



BMA authorized seal for
self-certified product placement:

36% minimum content

65% maximum



BMA authorized seal for
self-certified product placement:

66% minimum content

85% maximum



BMA authorized seal for
self-certified product placement:

86% plus content



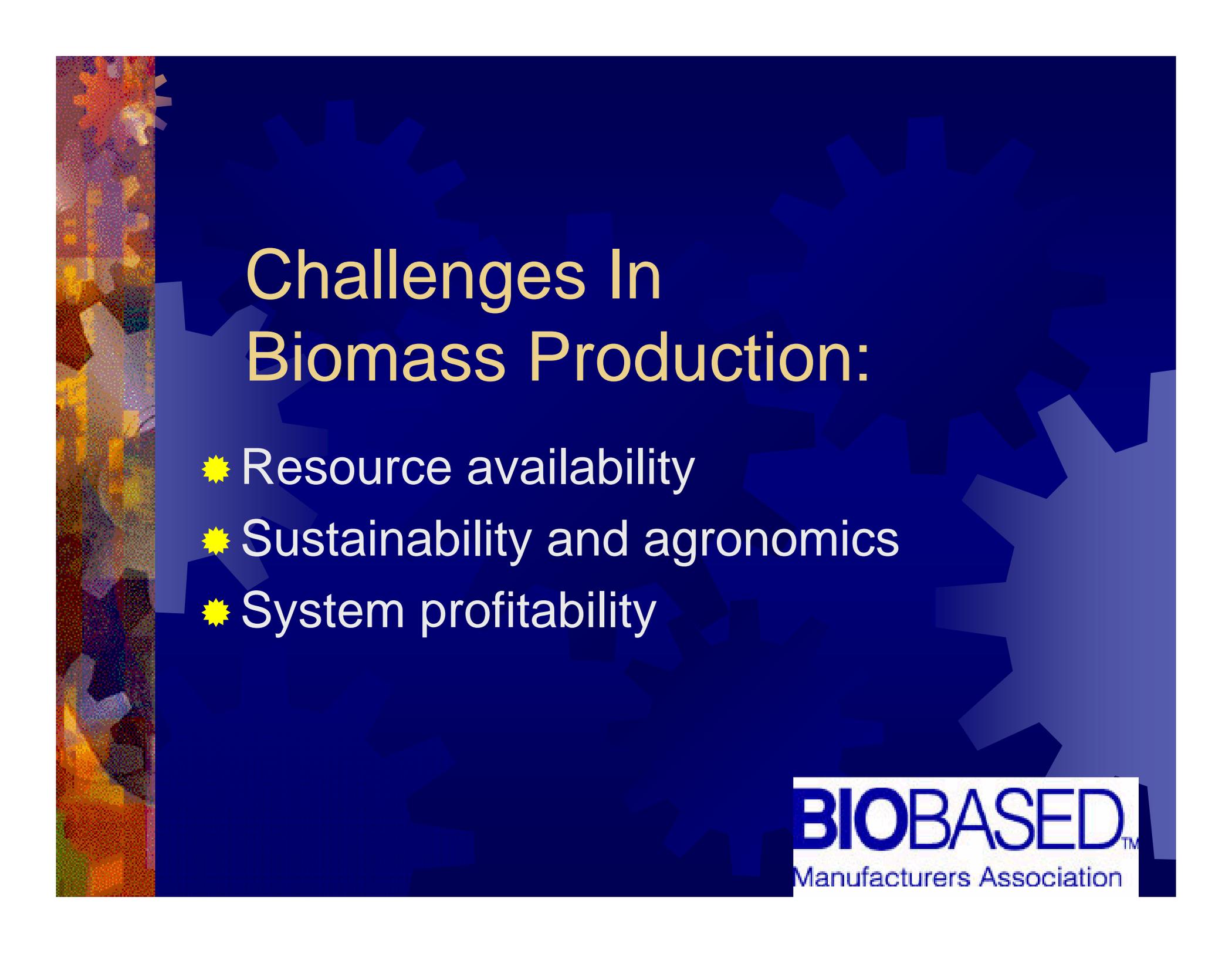
Eleven USDA Product Categories:

- ✦ Adhesives
- ✦ Construction materials and composites
- ✦ Fibers, paper and packaging
- ✦ Fuel additives
- ✦ Landscaping materials, compost & fertilizer
- ✦ Lubricants & functional fluids
- ✦ Plastics
- ✦ Paintings & coatings
- ✦ Solvents & cleaners
- ✦ Sorbents
- ✦ Inks



Opportunities Are Divided Into Six Categories:

- ✦ Production of biomass
- ✦ Harvest & Collection
- ✦ Storage
- ✦ Pre-processing
- ✦ System Integration
- ✦ Manufacturing



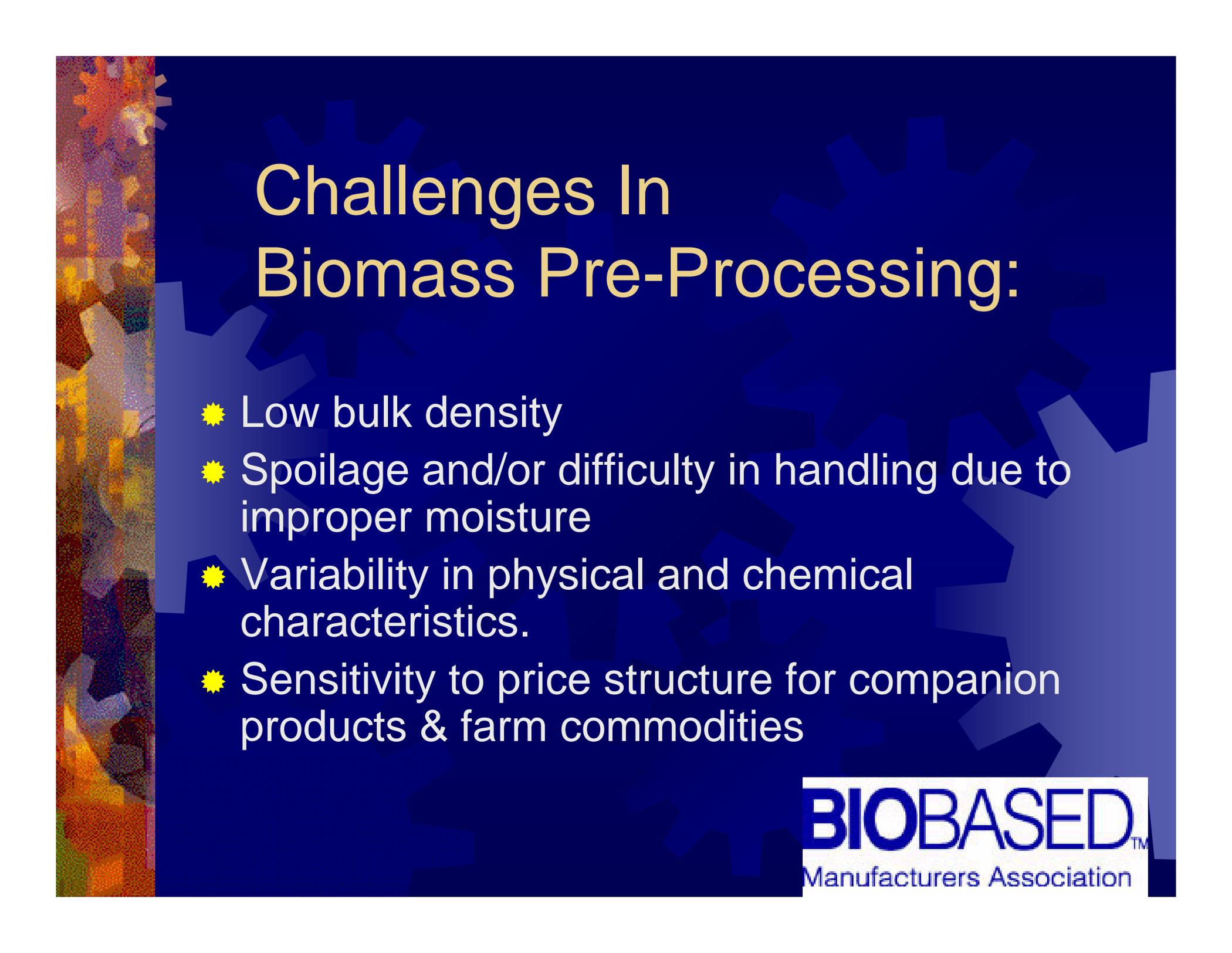
Challenges In Biomass Production:

- ✦ Resource availability
- ✦ Sustainability and agronomics
- ✦ System profitability



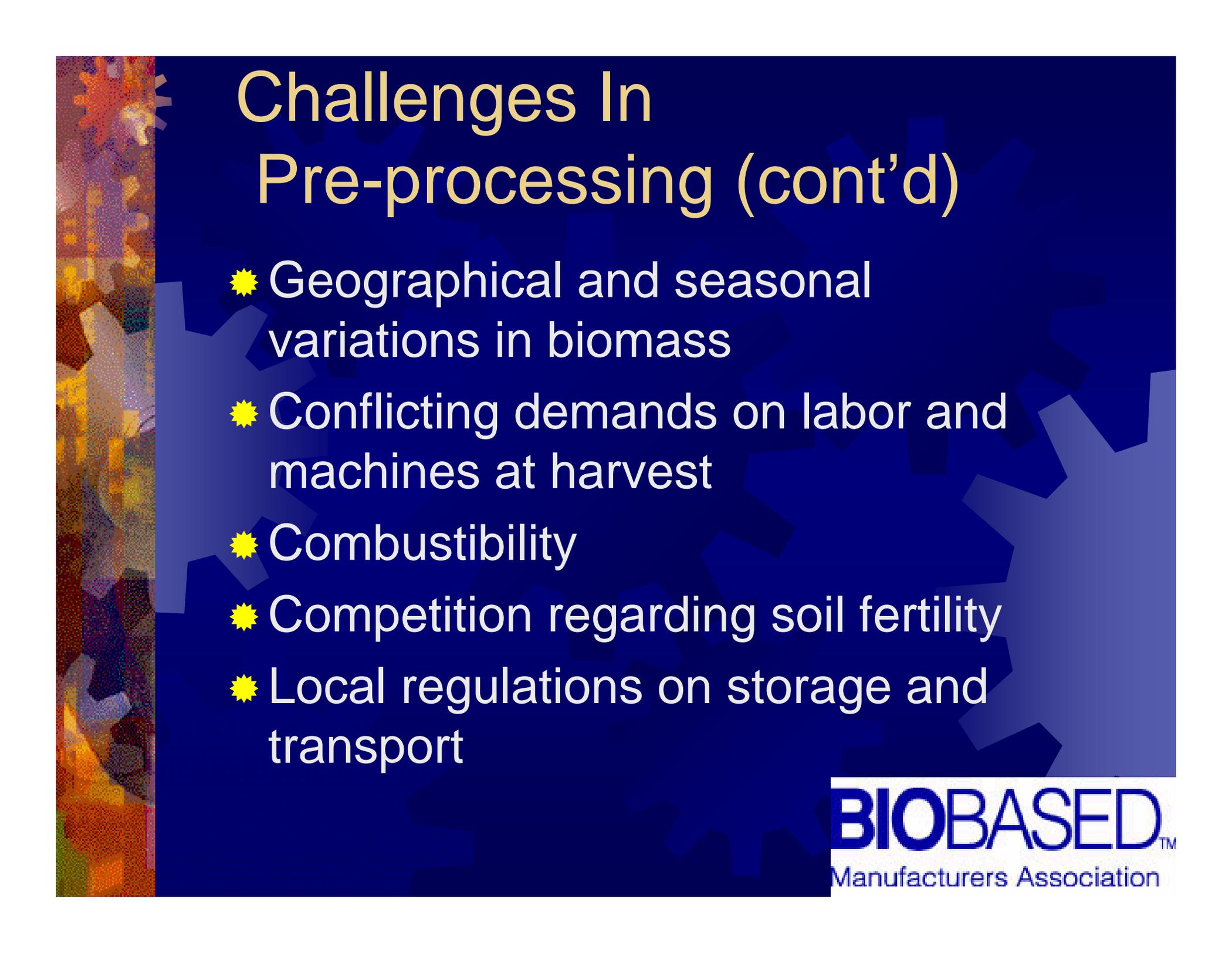
Challenges In Biomass Storage:

- ✦ Feedstock quality & monitoring
- ✦ Dry storage systems
- ✦ Wet storage systems



Challenges In Biomass Pre-Processing:

- ✦ Low bulk density
- ✦ Spoilage and/or difficulty in handling due to improper moisture
- ✦ Variability in physical and chemical characteristics.
- ✦ Sensitivity to price structure for companion products & farm commodities



Challenges In Pre-processing (cont'd)

- ✦ Geographical and seasonal variations in biomass
- ✦ Conflicting demands on labor and machines at harvest
- ✦ Combustibility
- ✦ Competition regarding soil fertility
- ✦ Local regulations on storage and transport



Challenges In Manufacturing

- ✦ Variability of content intrinsic to the manufacturing process.
- ✦ The nature of formulae to vary, depending on raw material prices.
- ✦ Variability within the raw materials themselves.
- ✦ Cost of enzymes that convert cellulose to sucrose for ethylene production
- ✦ Low net energy ratios

Why these barriers must and will be overcome:

- ✦ Biobased products better for consumer health
- ✦ Biobased products better for the environment
- ✦ Biobased products better for the economy
- ✦ Biobased products enhance national security





Our guiding principle:

“I believe the great Creator put oil under the ground to give us a little breathing space ...but that in the future, we will get all we need from our farms, God’s true storehouse. For we can create every human need from the things that grow.”

---- George Washington Carver