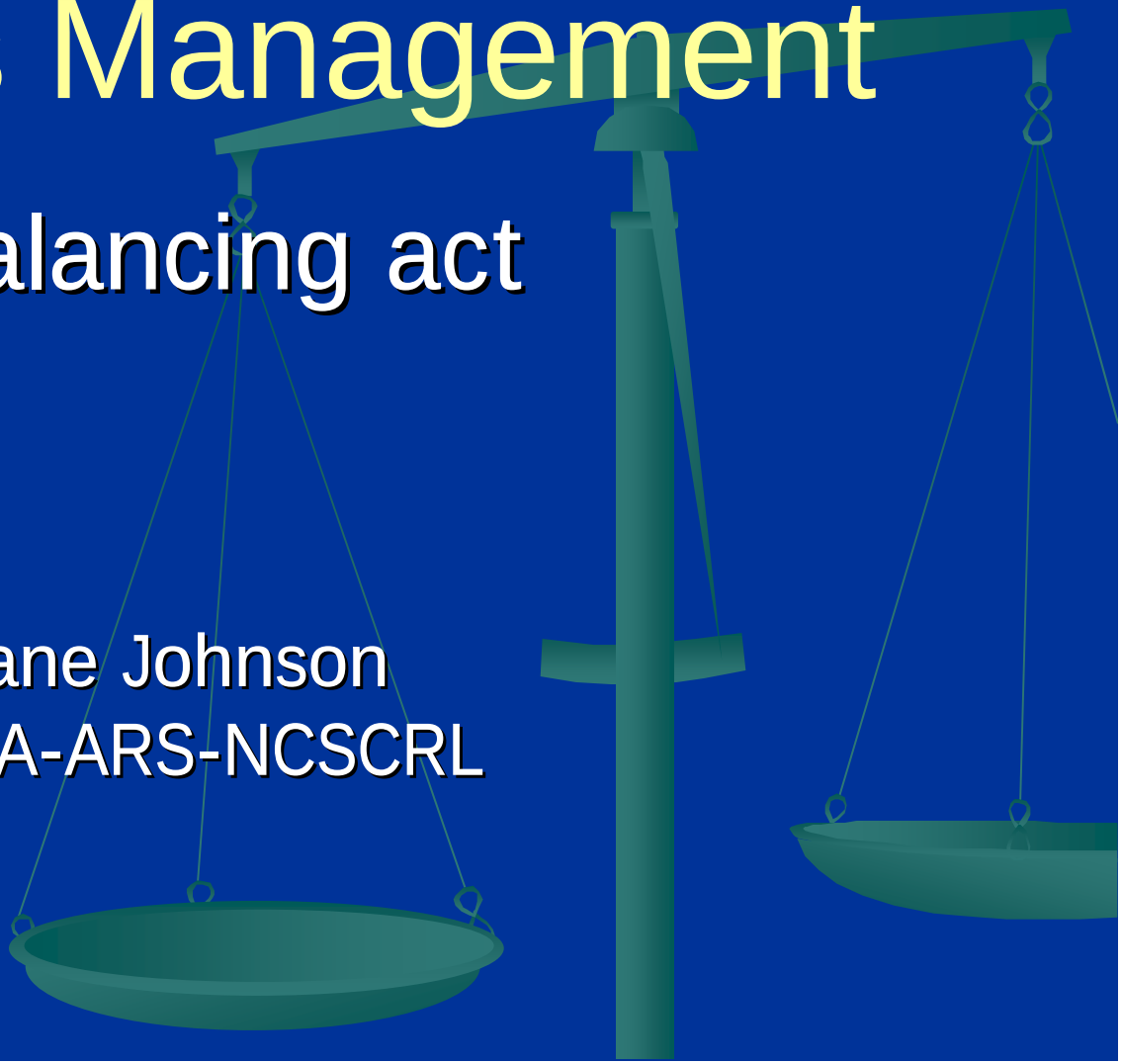
# Carbon Sequestration & Biomass Management

## A balancing act



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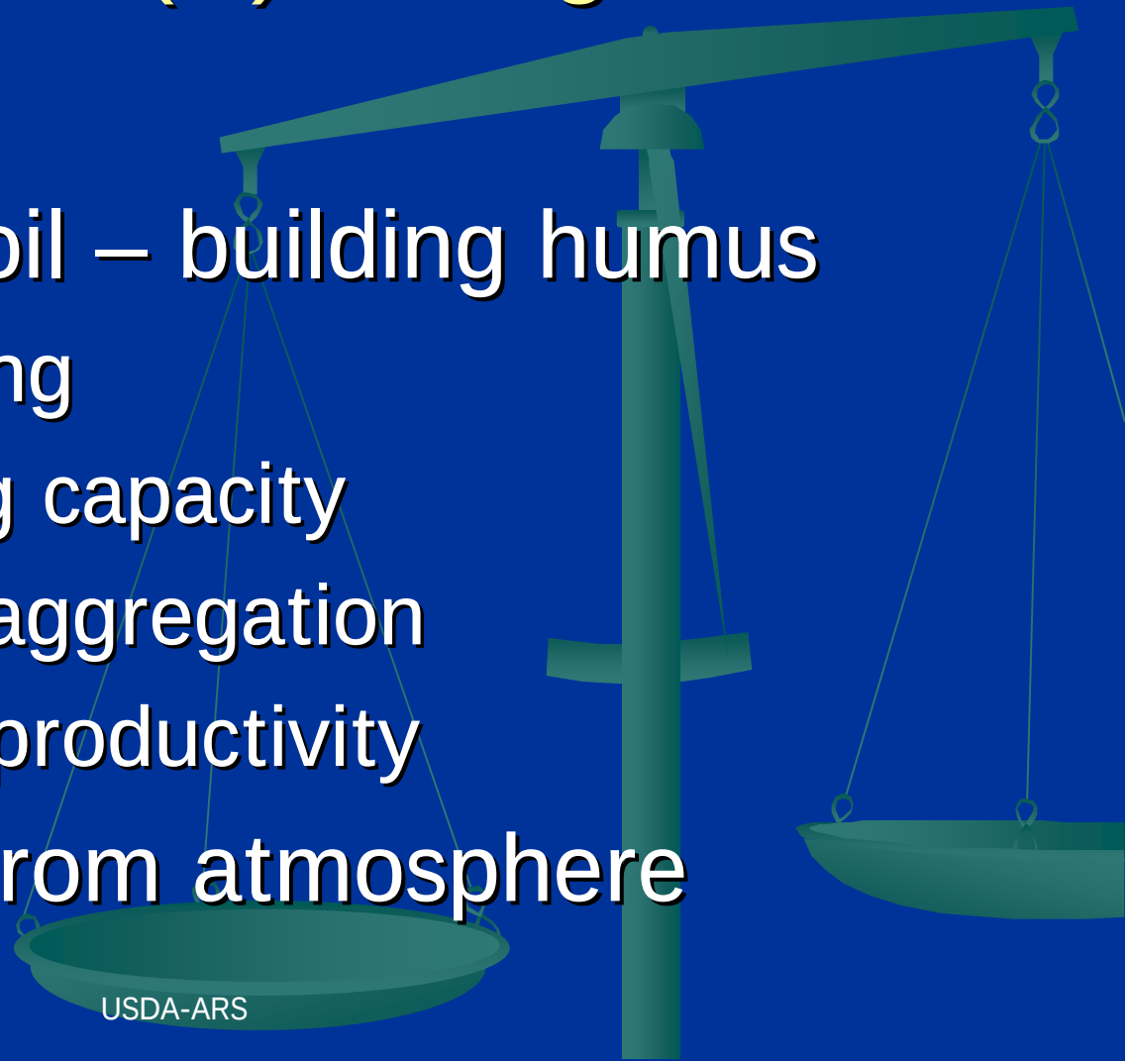
# Biomass management for Carbon (C) storage

- Storing C in soil – building humus
  - Nutrient cycling
  - Water holding capacity
  - Improve soil aggregation
  - Maintain soil productivity
- Remove $CO_2$ from atmosphere



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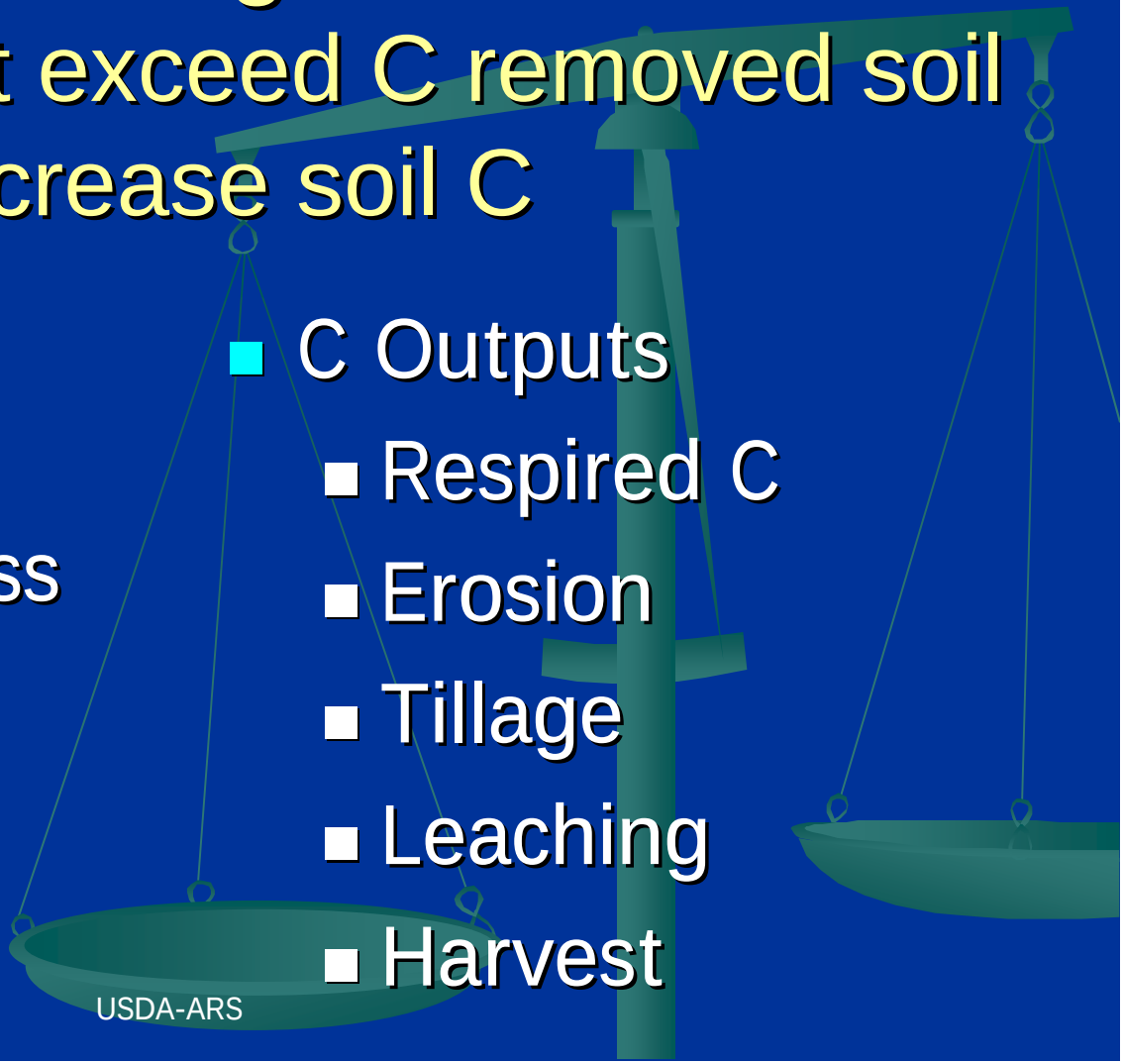
# Biomass management for C storage

## C in to soil must exceed C removed soil to increase soil C

- C Inputs
  - Crop above ground biomass
  - Crop root and their exudates
  - Manure
- C Outputs
  - Respired C
  - Erosion
  - Tillage
  - Leaching
  - Harvest



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Tillage
Wind
Water
LaPorte, IN 2004
http://www.umanitoba.ca
Wakeeney, KS
L. Kucerik, 2004
MN, D. Reicosky
Morris, MN 2003
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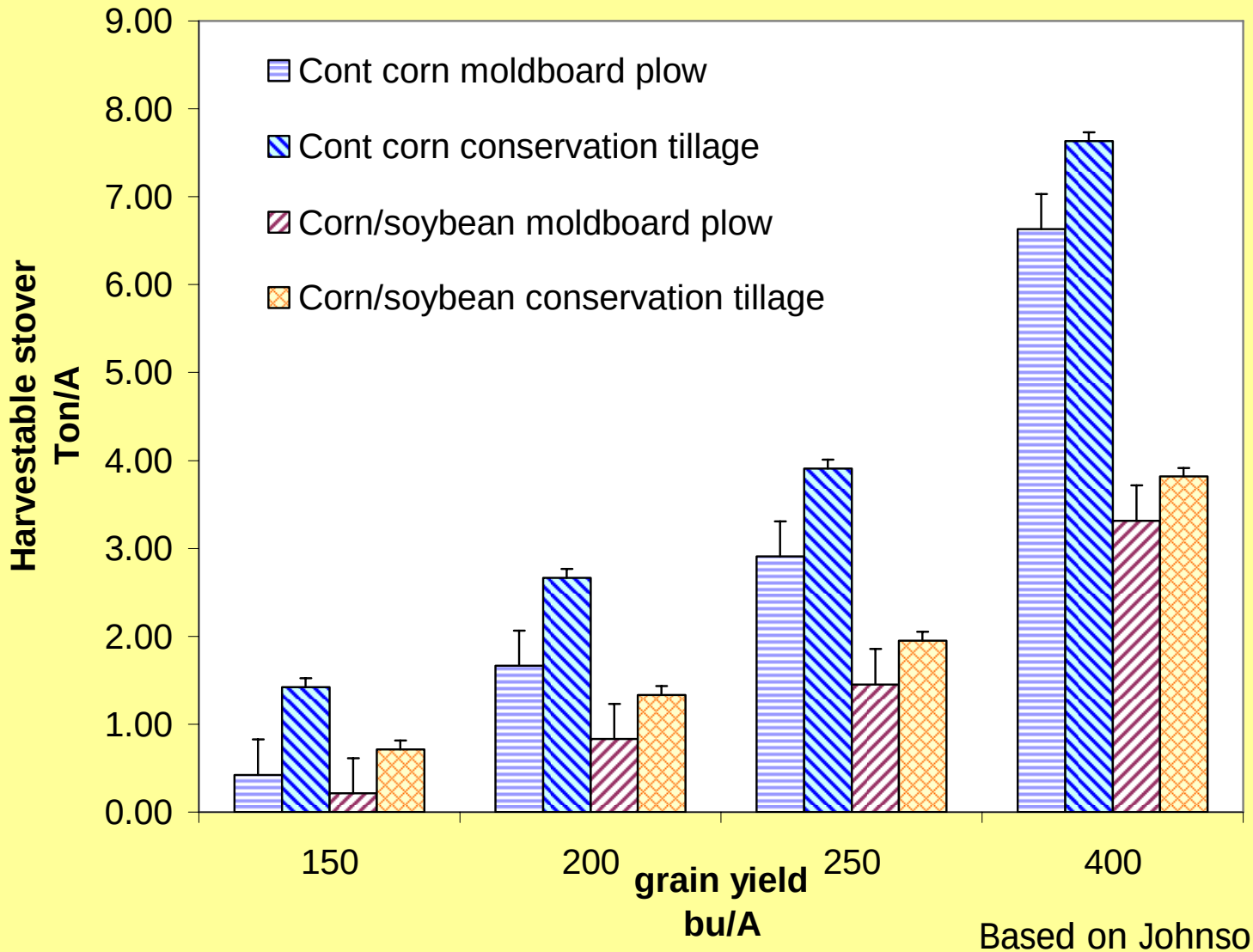
# Estimates of harvestable stover

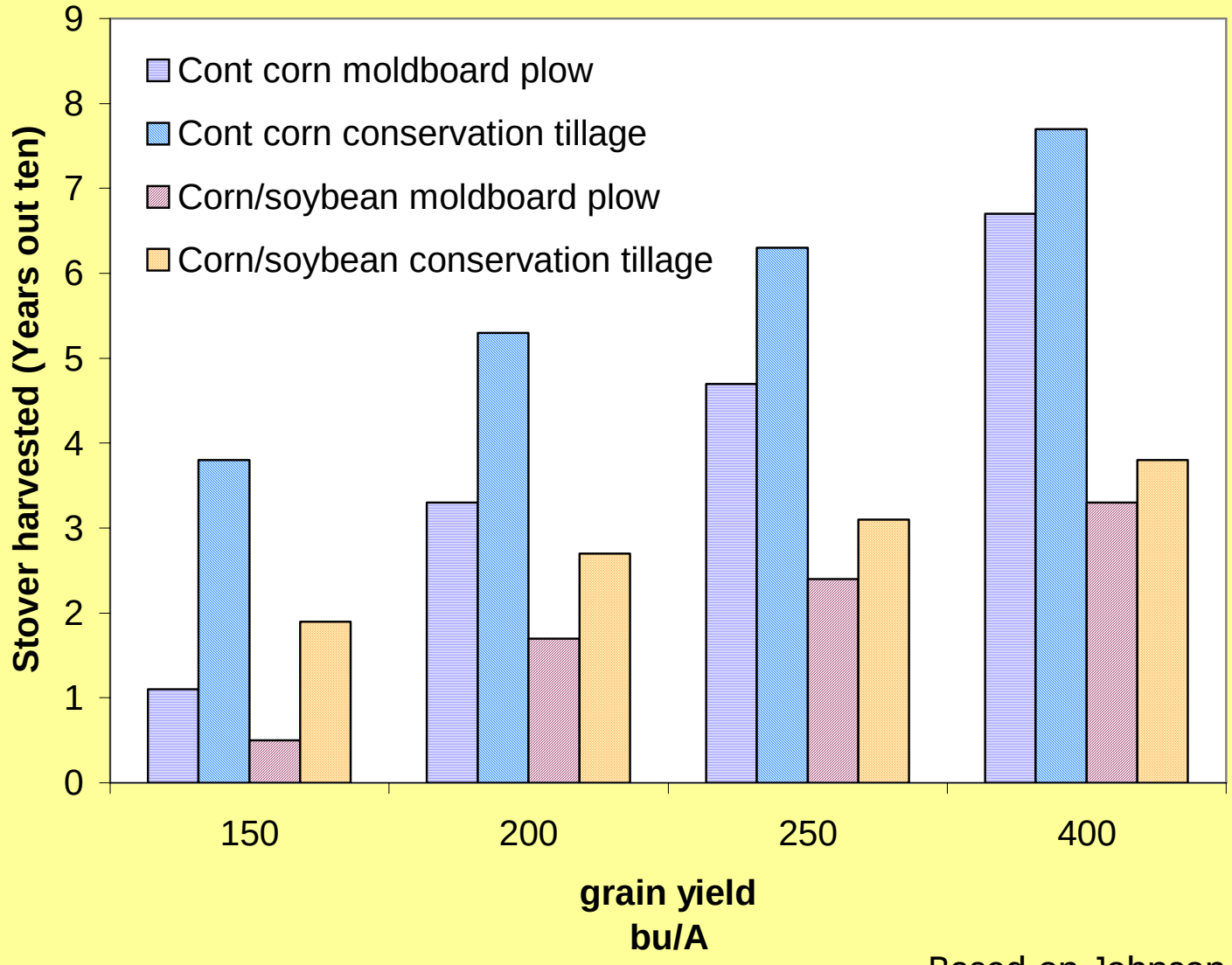
## Based 3.3 Ton/A moldboard plow and 2.3 Ton/A conservation tillage to maintain soil C




Based on Johnson et al 2006

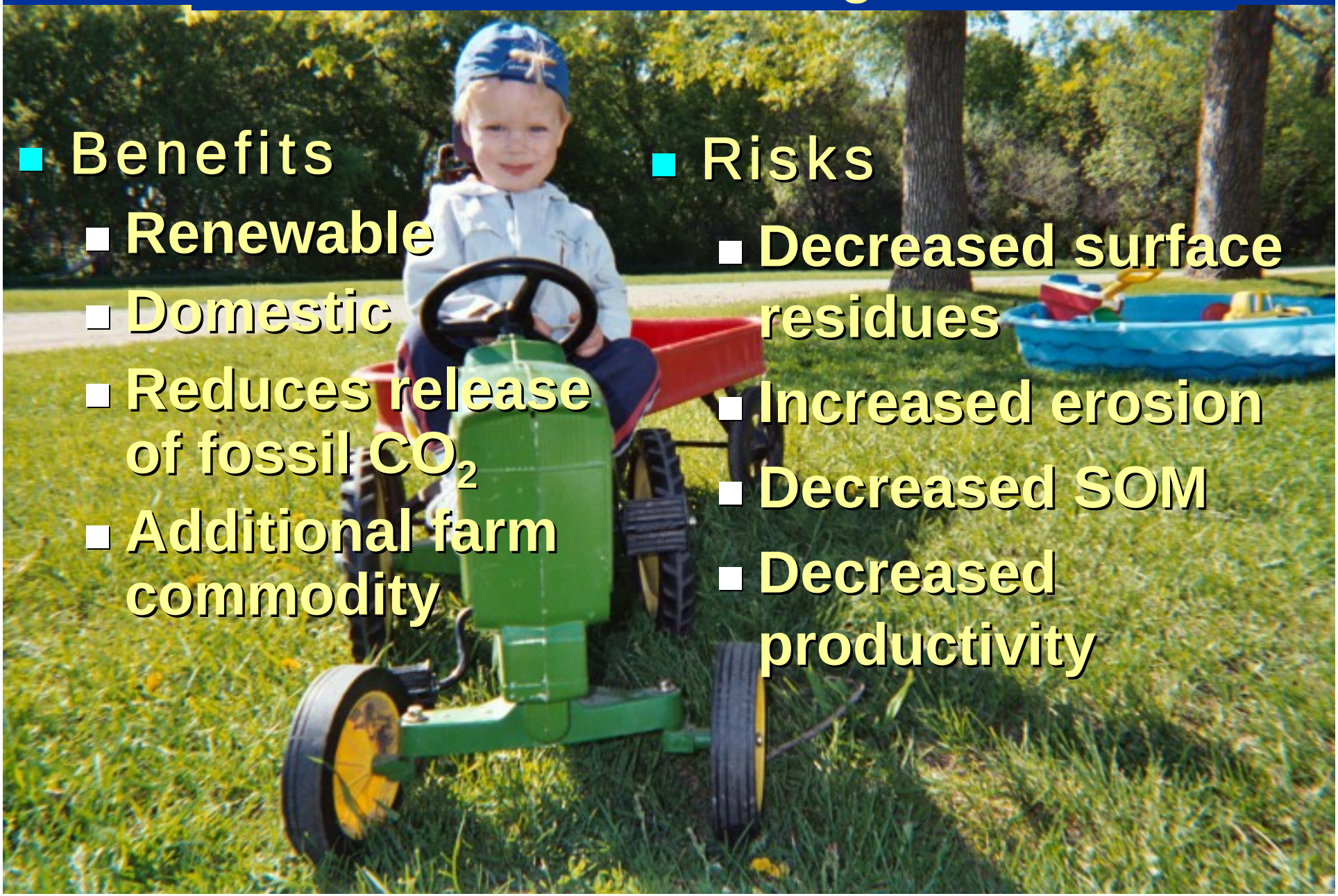
# Harvest frequency

## Based 3.3 Ton/A moldboard plow and 2.3 Ton/A conservation tillage to maintain soil C




Based on Johnson et al 2006

# Sustainable Harvesting of biomass



- Benefits
  - Renewable
  - Domestic
  - Reduces release of fossil $CO_2$
  - Additional farm commodity
- Risks
  - Decreased surface residues
  - Increased erosion
  - Decreased SOM
  - Decreased productivity