

Sustainable Agriculture: Perspectives from the Great Corn Desert

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This is a quiz!

Ecological Literacy

1. How many people are there on earth?
2. How many people are added annually?
3. How many people are there in the USA?
4. How many species are there on earth?
5. How many species go extinct each year?

World human population

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15.2 trillion people

range: 5 million – 9×10^{12}

Sustainability of industrialized agriculture

- Defined as large scale, large size farming
- Includes: continuous no-till, cover-cropping, precision application of fertilizers & pesticides, biotechnology.

[New pesticide announced just this past week: combines both Round-Up and 2,4-D]

Sustainability of industrialized agriculture

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- Better workforce productivity.
- Hunger would be worse w/o modern AG.

W.C. Motes, internal report, Global Harvest Initiative

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- Farming intensively requires less land.
- Avoids negative impacts of slash & burn.
- Improved food safety.
- ↑ global stability because ↑ food availability.

Challenges for Industrial Farming

- Expanded purchasing power of middle class in developing nations. More people wanting “high quality” diet (= high meat content)
- Switch to renewable fuels

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Another opinion

- Concerns:
 - monocultures erode biodiversity
 - synthetic chemicals are source of pollution
 - increased soil erosion
 - increased water consumption
 - growth-promoting antibiotics

Harrison et al. 2002. Environmental Health Perspectives

Supporting evidence

- Meat-based diets included excessive saturated fats, contribute to heart disease, colon cancer, Type II diabetes.
- China doubled meat consumption in 1990s. Before 1950, most common diseases: measles, tuberculosis, senility. After 1985: tumors, heart disease, cardiovascular disease.

Supporting evidence

- 70% of USA-produced antibiotics are used on animals to promote growth.



What are we doing to improve?

Conservation Reserve Program (CRP). Takes marginal lands (in terms of productivity) and pay farmers to plant grasses or trees there.

Originally designed to reduce soil erosion. Also greatly increased wildlife habitat.

However, farmers pulling out of CRP because high prices for corn (ethanol)



One species that is compatible with industrialized farming



American Golden-Plover
(close relative of Eurasian G-P)

Long-distance migrant, travelling
from Arctic to pampas
grasslands of Argentina.

Stops in west-central Indiana
during spring migration, uses
large row-crop fields before
planting.

We captured 100 in spring 2012



Figure 3. Capture and processing techniques employed by collaborators Joop Jukema and Piet Vlas (Photos from Jukema et al. 2001)

Golden-Plovers & row crops

- Plovers were molting into their breeding plumage. Another local study showed birds stayed several weeks.
- High levels of earthworms in fields, birds also need large open vistas.
- Therefore, modern row-crop agriculture is providing needed habitat for a least one species of Indiana conservation concern. Current additional problem: wind energy