

# Rachel Carson Conference

Symposium on  
Pesticide Dependency

# WORLD POPULATION

7 Billion people

60% Billion malnourished

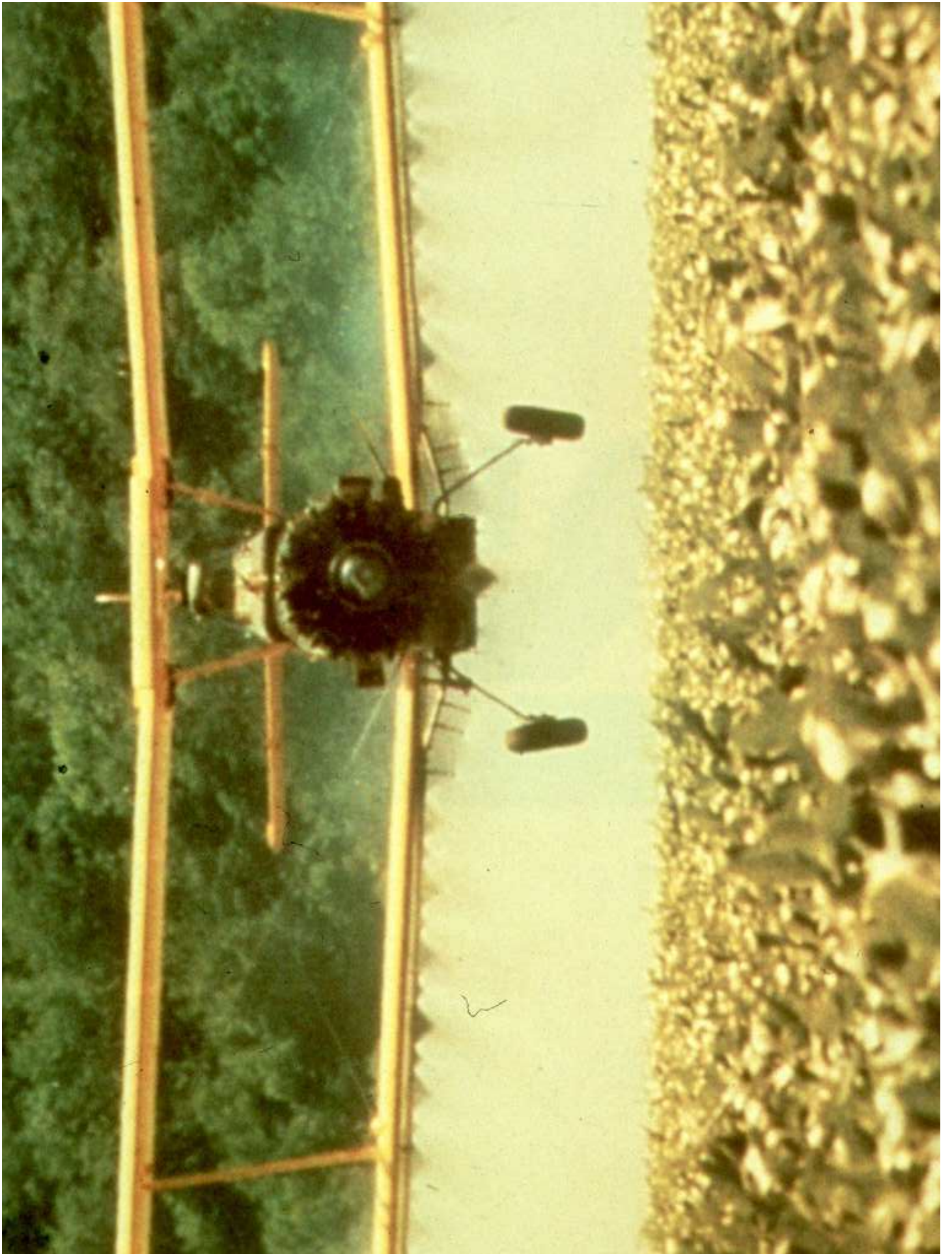


# FOOD CONSUMED per CAPITA

2,200 lbs per year









# World Pesticide Use

6 billion pounds

\$45 billion/year

# World Crop Losses

40% Pre-Harvest

Losses

25% Post-Harvest Losses

Total Losses = 52%

# FOOD COMTAMINATION

Pesticides in Foods

5% above Tolerance

Fruits and Vegetables

# Human Poisonings

26 million = world

220,000 deaths

# U.S. Pesticide Poisonings

300,000 non-fatal poisonings

EPA

# Rachel Carson Leadership

Carson Stimulation

Designed Housefly Control

Required Less than 1,000th Dosage



# U.S. Corn and Soybeans

Insecticides plus Herbicides on

Corn and Soybeans

Total 310 billion kg



# Organic Corn and Soybeans

Zero Pesticides

Zero commercial nitrogen fertilizer

Cover legume crop

# 22-year Experiment

Corn and Soybean Yields

Exactly the Same

In organic and commercial treatments

# Organic Treatment

No Soil Erosion

35% extra labor

Reduced costs

# Organic Treatment

33% Reduced fossil energy

No commercial fertilizers

No insecticides or herbicides

# Why are Pesticides Heavily Used

On Corn and Soybeans?

And on other crops in the U.S.?

# DDT

First used in 1945

By 1950 DDT Resistance







# 2,4-D Herbicide Impacts

Corn borer 33% larger +

Produced more eggs

Corn leaf aphids 1,700

# 2,4-D Herbicide

Black smut disease increased 5+

Lost resistance to Southern corn

Disease pathogen







# Natural Enemies Killed

Cotton = \$200 million

Other Crops = \$300 million

Total = \$500 million

# Rice Indonesia

Brown Plant Hopper

\$1 billion/year

# Natural Enemy Controls

50% - 90% Control in Crops



# Pesticide Resistance

520 insects & mites

200 weed species

150 plant pathogens

# Costs of Resistance

\$1.5 billion/year



# Honeybees & Wild Bees

Benefits = \$40 billion/year

Pesticide Losses = \$300 million/yr

# Essential Role of Bees

About one third of all food

Crops require bee pollination

# Aircraft Applications

50% drift regular spray

75% drift ultra-low volume

Never reaches target area

# Ground & Surface Water

Scientific Assessment

\$20 billion/year

Pesticide polluted water

# Fishery Losses

EPA = \$10/fish

\$25 million/year



# Bird Kills

72 million birds/year

\$2.1 billion/year

# Environmental & Public Health

Total Costs

\$12 billion/year

No nestlings

# Sweden Pesticides 10 years

Reduced pesticides 68%

Reduced human poisoning 77%

# Indonesia Pesticides Rice

Reduced pesticides 65%

Rice yields increased 12%



# Land and Food

99.7% = Land

0.3% = Oceans



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Disruption

Teach

Reflection

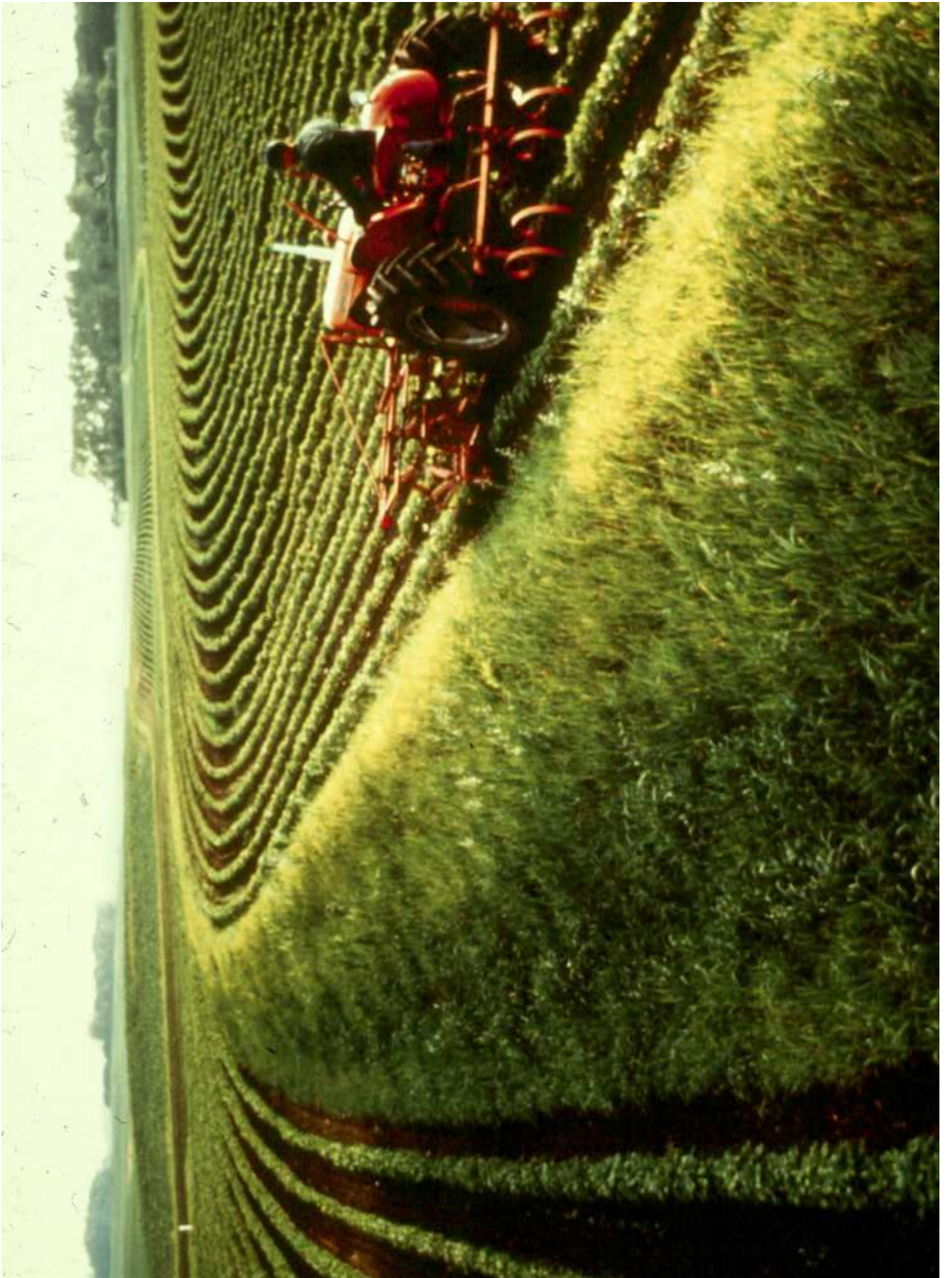
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# WATER USE IN CORN

6 billion liters/growing season/ha

600,000 gallons/acre

# WATER INPUTS

1,000 liters/kg grain

45,000 liters/kg beef

# WATER: SOIL ORGANIC MATTER

5% soil organic matter

Holds 820,000 liters water/hectare





# INVASIVE PEST SPECIES

Invasive Species = 50,000

Plants = 25,000

Microbes = 20,000



# GMO's

40% of research focused on  
Herbicide Tolerance in crops  
No increase in yields

# Herbicide Tolerance

75% of GMO crops are  
Herbicide Tolerant  
No yield increase

# World Pesticide Use

World = 3 billion kg

U.S. = 0.5 billion kg

# World Crop Losses

Pre-Harvest = 40%

Post-Harvest = 25%

Total = 52%

# World Human Poisonings

26 Million Pesticide Poisonings

220,000 deaths

# Damage and Control Costs

\$137 billion per year

# Causes of Extinctions

Human population = 45%

Invasive species = 40%

# Cotton Pesticides

Insecticides = 3-4 kg/ha



# Perennials Grains

Energy

Soil Erosion

Rainfall Timing

# Energy Inputs in Corn Ethanol

Total Input = 6,660 kcal (liter)

Total Output = 5,130 kcal (liter)

Minus = 29%

# Corn Environmental Impacts

1,700 gal. Water/ethanol gal.

Uses more nitrogen fertilizer

More pesticides

# CROPLAND DECLINE

20% per decade

# IRRIGATION LOSS

10% loss/decade

# FERILIZER DECLINE

17% decline/decade

# WORLD GRAIN per PERSON

1960 = 270 kg

1984 = 340 kg

2004 = 300 kg

