

Agricultural Health Study

A long term health study of pesticide applicators and their spouses with comparisons to the general population



To identify factors that promote good health
To study ag-related pesticide exposures and practices
Most comprehensive study of agricultural health ever conducted in



Previous Ag Health Studies

- **Health Pluses:**
 - Farmers are healthier than general population
 - Farmers live longer
 - Lower heart disease deaths
 - Lower death rate to some cancers: !
esophagus, bladder, colon
 - Lower smoking rates?



- **Health Problems:**
 - Agriculture: a risky occupation
 - Greater risk of lung disease (not lung cancer) & skin conditions



Higher rates of some cancers: Hodgkin's leukemia, multiple myeloma, non-



Early Health Discoveries

- 14% of applicators had at least **ONE** high pesticide exposure in their careers
- **Mostly with five pesticides:**
 - Herbicides of alachlor (IntRRo, Micro-Tech, Bullet, Lariat), 2,4-D, trifluralin (Treflan), atrazine and insecticide phorate (Thimet)
- **Related Practices:**
 - Repair of application equipment
 - Delay in changing clothes
 - **Mixing** or **side-soiled** clothes
 - **Mixing** or **side-soiled** clothes **with** fam



Personal Protective Equip. (PPE)

- **Good News:**
 - Research shows PPE may reduce pesticide exposure by 90%
 - **Chemical-resistant glove use**

- **Greater in Iowa**

- **Respirator Use**

- **Greater in North Carolina**
fumigants in use)



(more

- **Bad News:**

- **Fabric or leather gloves used**

- **4% in Iowa**

- **18% in North Carolina**



New: Ag. Health Study

- Participants: 90,000 people**
- Certified Pesticide**

Applicators and Spouses

–IOWA:

- 31,877 farmers**
- 21,771 farm spouses**
- 4,916 commercial applicators**



–NORTH CAROLINA

- 20,518 farmers**
- 10,567 farm spouses**

About the Participants

- Enrolled in study 1993- 97 during university Pesticide Safety Education Programs
- Applicators: 3% are female
- Spouses
 - Enrolled via mail & telephone
 - 51% active in farm work
 - 40 % mixed, applied pesticides



Ag Health Study Results

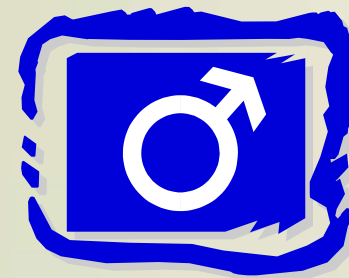
- **Applicators:**



- Applicator cancer rate lower than general population

- **Rates of 18 of 20 cancers lower**

- **Prostrate Cancer**



- 14% higher in male applicators

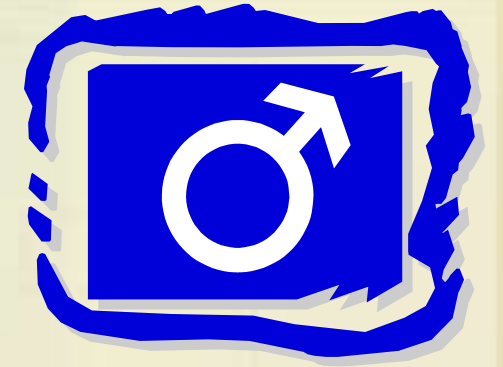
- **Skin Melanomas**



- 50% higher among farm wives



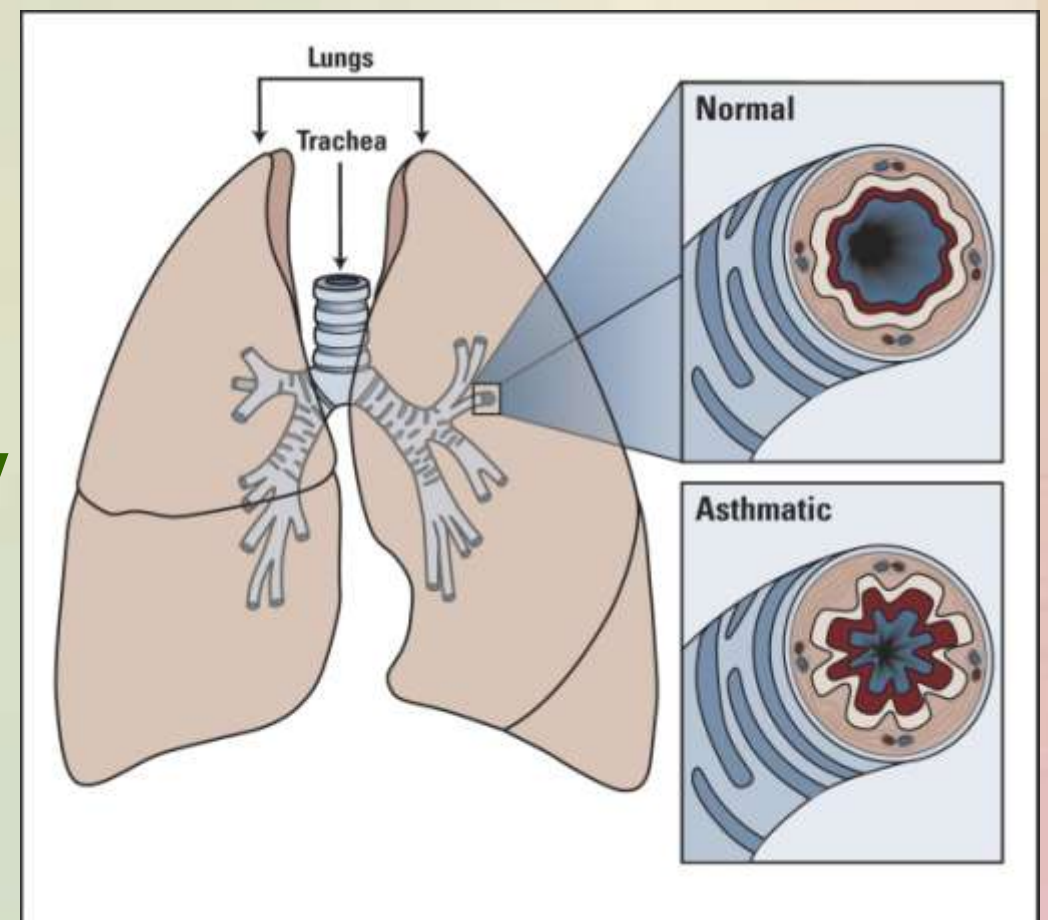
Prostate Cancer Associated With



- **Methyl bromide fumigant**
- **Chlorinated pesticides (men over 50)**
 - Aldrin, chlordane, DDT, dieldrin, endrin, hexachlor, toxophene
- **Five pesticides with men with a family history of prostate cancer**
 - Insecticides: chlorpyrifos (Lorsban), coumaphos (Co-Ral), fonofos (Dyfonate), permethrin (with animal uses)

Respiratory Health

- **Wheeze (airways in lungs are narrowed) associated with...**
 - **Pesticides (Paraquat, parathion, malathion, chlorpyrifos, atrazine, alachlor, EPTC)**
 - **Diesel tractor use**
 - **Solvent use**
 - **Animal production**
 - **Egg production, dairy**
 - **Daily vet procedures**



Female Reproductive Health

- **Participants: 32,300 farm wives**
 - Compared users and non-users of pesticides
- **Ages: 21 to 40 years**
- **Pesticide users had...**
 - Longer cycles, missed periods



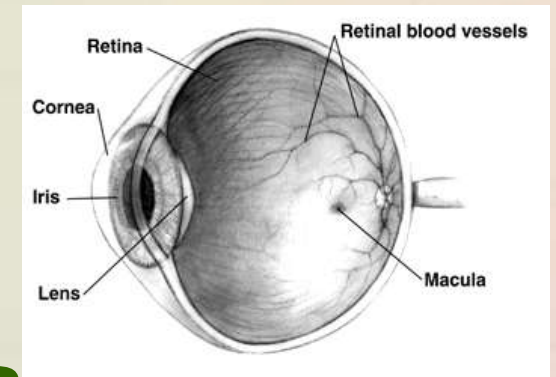
**Farmer's Wives Female
Applicators
(Pesticide Users)**



**Farmer's Wives
(Non-Users)**

Eye Health – Vision Loss

- Degeneration of retina
- Seen with applicators and farm wives
 - Fungicides: benomyl, captan, chlorothalonil, copper ammonia carbonate, ferbam, maneb, metalaxyl, PCNB and sulfur
 - Application methods: hand spray guns, backpack sprayers, or mist blowers / foggers
 - Certain crops: orchard fruit, Christmas trees and peanuts
 - DDT, dicofol and endosulfan (organochlorines)
 - Dichlorvos, cygon, guthion, imidan, malathion, orthene and prolate (organophosphates)
 - Carbaryl and oxanyl (carbamates)



Glyphosate (herbicide)

- **Used by 75% of male applicators**
 - **No increased risk of prostate or lung cancer**
- **BUT: Follow-up is needed on one type of cancer called multiple myeloma (plasma cells of bone marrow, involved with immune system and the body's ability to fight infections and diseases)**

Breast Cancer

- Evaluated 50 pesticides with 32,300 farm wives in study
- Spouses had *higher* breast cancer risk with *husband's use* of certain pesticides:
 - 2,4,5-TP (silvex herbicide - dioxin contaminated)
 - dieldrin (insecticide)
 - captan (fungicide)
 - diazinon (insecticide), but only in women with family history of breast cancer



Lung Cancer

- **Possible association with certain pesticides**
 - **Herbicides: metolachlor, pendimethalin**
 - **Insecticides: chlorpyrifos, diazinon**



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