South Dakota Department of Agriculture

Pesticide residues in plant foliage

Project

- Compiled information from SDDA database containing sample information from 1990 – March, 2004.
- About 2715 plant foliage samples analyzed for residue of pesticide compound or multiple compounds.

Project

- Removed water, soil and food project samples.
- Removed all routine sampling (formulation)

Popular theory

- With today's technology, any pesticide can be found in any sample due to better testing equipment and lower detection limits.

Detection limits

- The detection limits used for plant tissue samples by SDDA have remained the same for the last 14 years.

Detection limits for foliage samples

- 2,4-D / .005 ppm
- Dicamba / .005 ppm
- Glyphosate / .01 ppm
- Atrazine / .005 ppm
- Picloram / .005 ppm
- MCPA / .005 ppm
  - ppm = parts per million

Project

- Foliage samples were counted for detection or no detection for any pesticide compound.
  - Most samples are tested for multiple compounds. (2 to 10, or more compounds)
  - 408 samples had no detection of any pesticide compound (about 15%)

Project

- Samples were counted for each individual pesticide compound in this study.
  - Detection - .005 ppm or higher
  - No detection - <.005ppm
  - Exception (glyphosate - .01 ppm)

Compounds looked at:

- 2,4-D
- Dicamba
- Glyphosate
- Atrazine
- Picloram
- MCPA

Compounds:

- These compounds were chosen because they were thought to be the most widely used and tested for in the samples.

Samples looked at:

- Plant foliage
  - Trees, shrubs and other ornamentals.
  - Grasses
  - Crops
  - Lawns
  - Gardens
  - Weeds

Samples - investigational

- Investigational refers to samples taken during a drift or misapplication complaint.
- Looking for something specific- damage symptoms.
  - Example: RR soybeans showing signs of cupping / puckering (test for 2,4D dicamba, picloram, MCPA, etc.)
  - Burning/yellowing of leaves or foliage (test for glyphosate)

Samples continued:

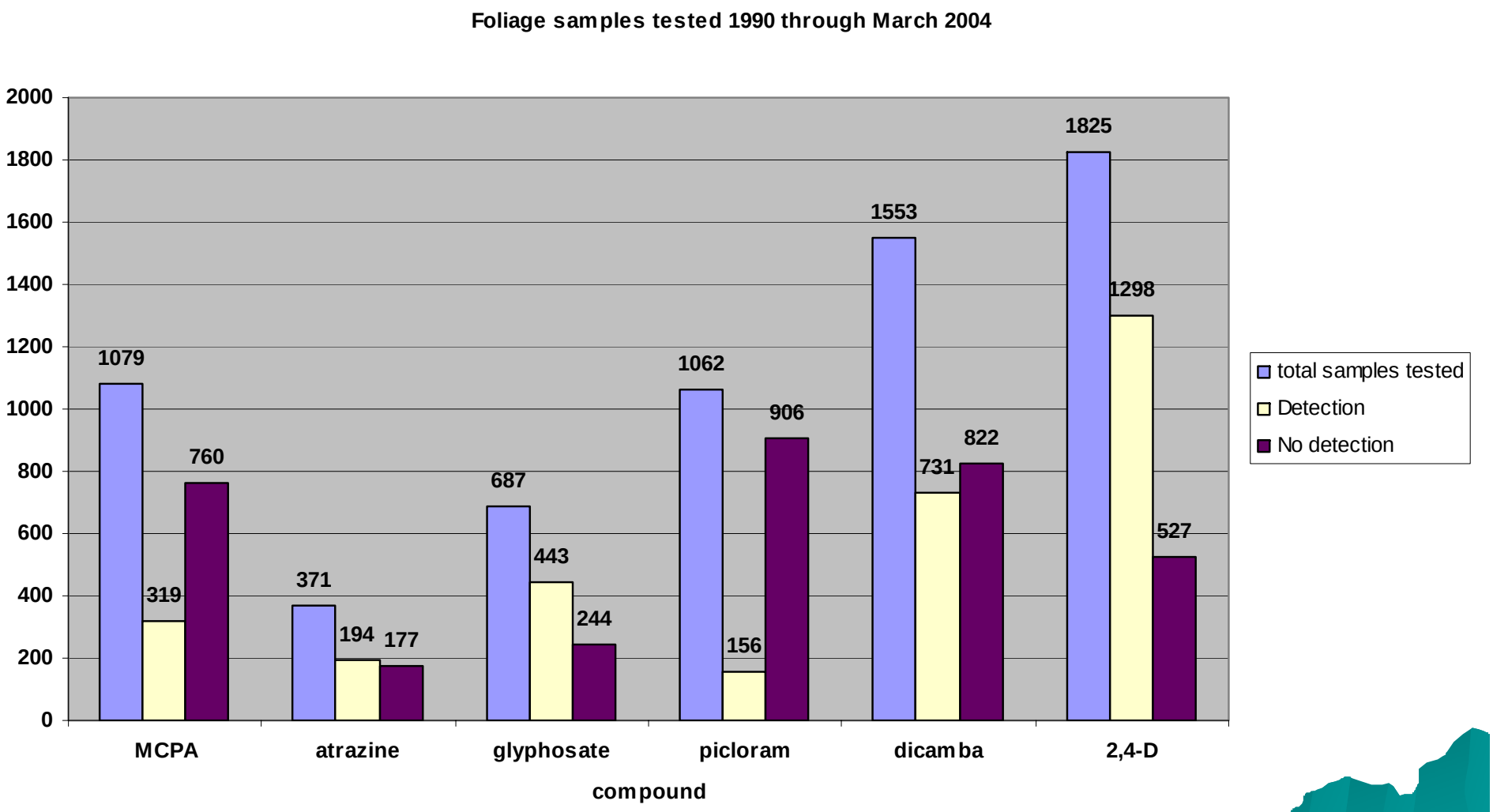
- Ag inspectors generally find out what is sprayed in the area to determine what to look for.
- Samples may be taken from damaged areas as well as from areas where damage is not visible. (Drift patterns)

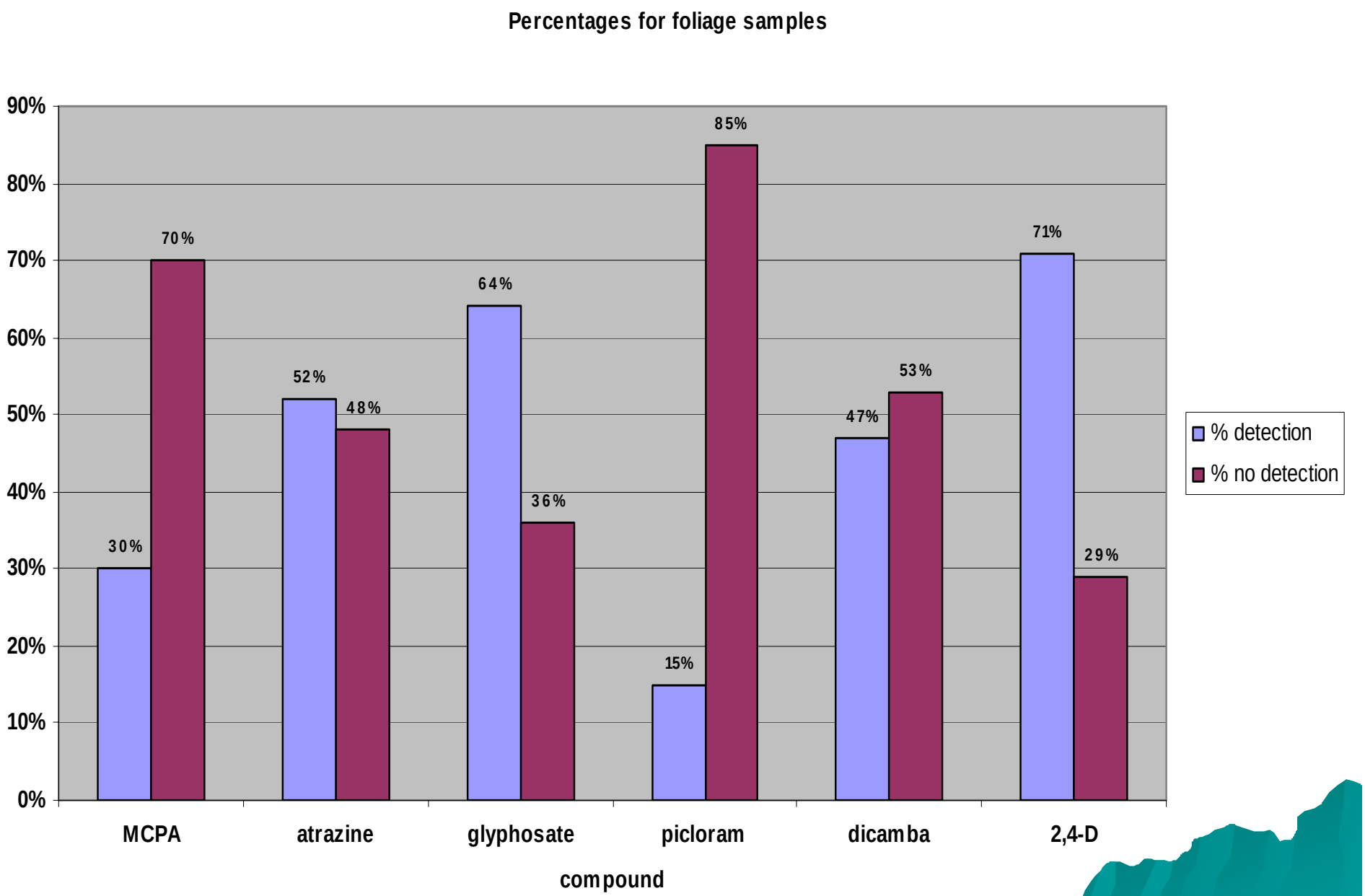
Corn Field – Drift

Sunflower Field – Tank contamination

Compounds looked at:

- 2,4-D
- Dicamba
- Glyphosate
- Atrazine
- Picloram
- MCPA

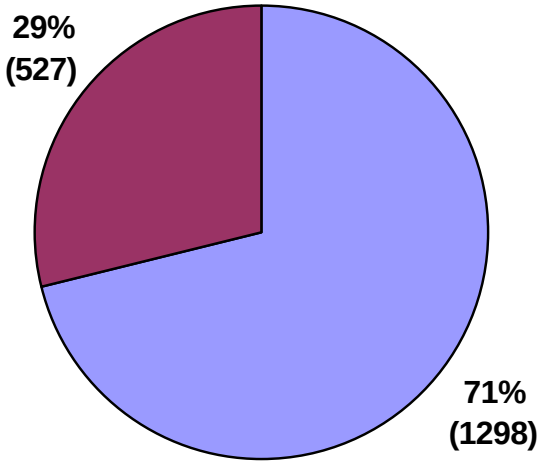

Foliage samples tested 1990 through March 2004
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1079
319
760
371
194
177
687
443
244
1062
156
906
1553
731
822
1825
1298
527
MCPA
atrazine
glyphosate
picloram
dicamba
2,4-D
compound
total samples tested
Detection
No detection


Percentages for foliage samples
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
30%
70%
52%
48%
64%
36%
15%
85%
47%
53%
71%
29%
MCPA
atrazine
glyphosate
picloram
dicamba
2,4-D
compound
% detection
% no detection

2,4-D

- 1825 samples analyzed for 2,4-D
- Detected in 1298 samples
- Not detected in 527 samples
- Percent detected – 71%

1825 foliage samples tested for 2,4-D

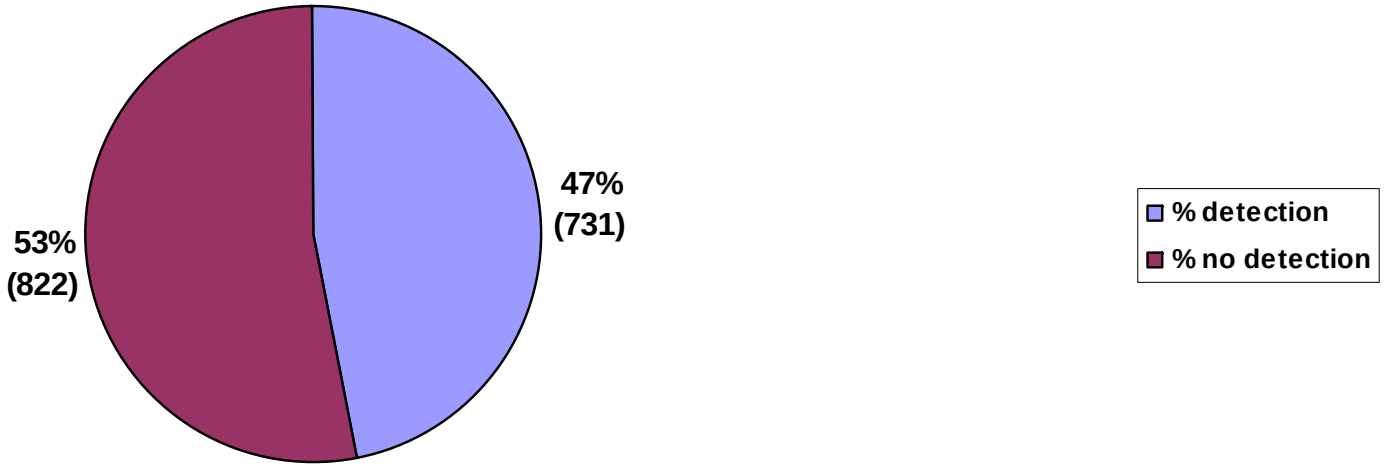


% detection
% no detection

Dicamba

- 1553 samples analyzed for dicamba
- Detected in 731 samples
- Not detected in 822 samples
- Percent detected – 47%

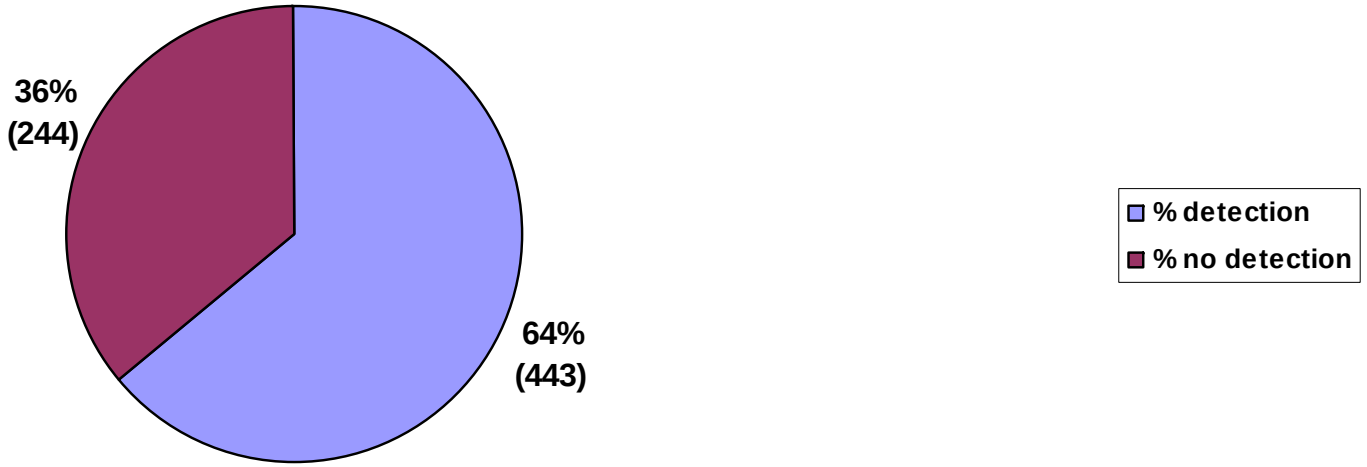
1553 foliage samples tested for dicamba



Glyphosate

- 687 samples analyzed for glyphosate
- Detected in 443 samples
- Not detected in 244 samples
- Percent detected – 64%

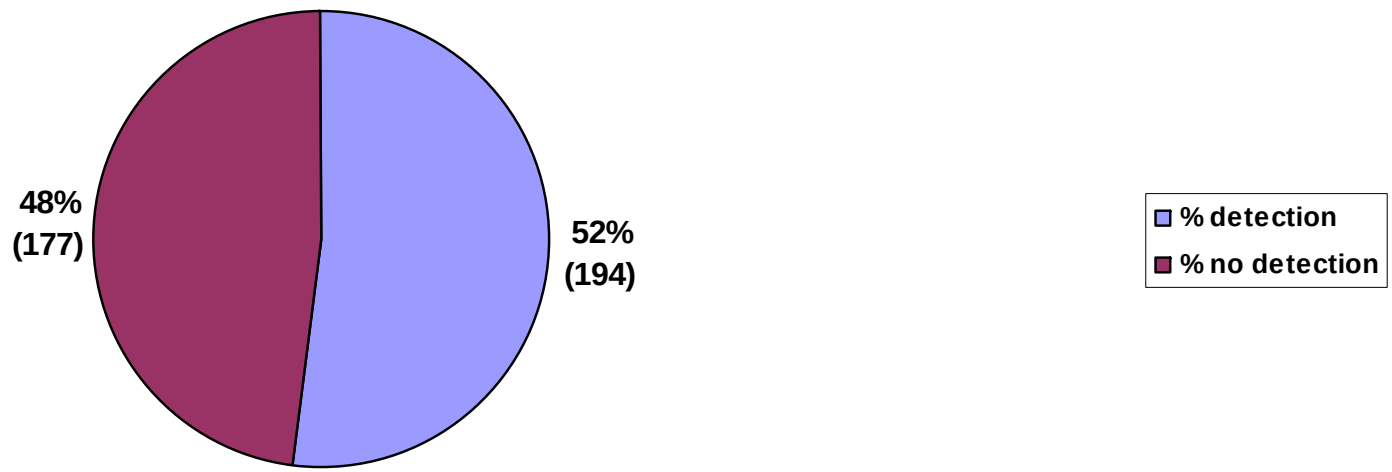
687 foliage samples tested for glyphosate



Atrazine

- 371 samples analyzed for atrazine
- Detected in 194 samples
- Not detected in 177 samples
- Percent detected – 52%

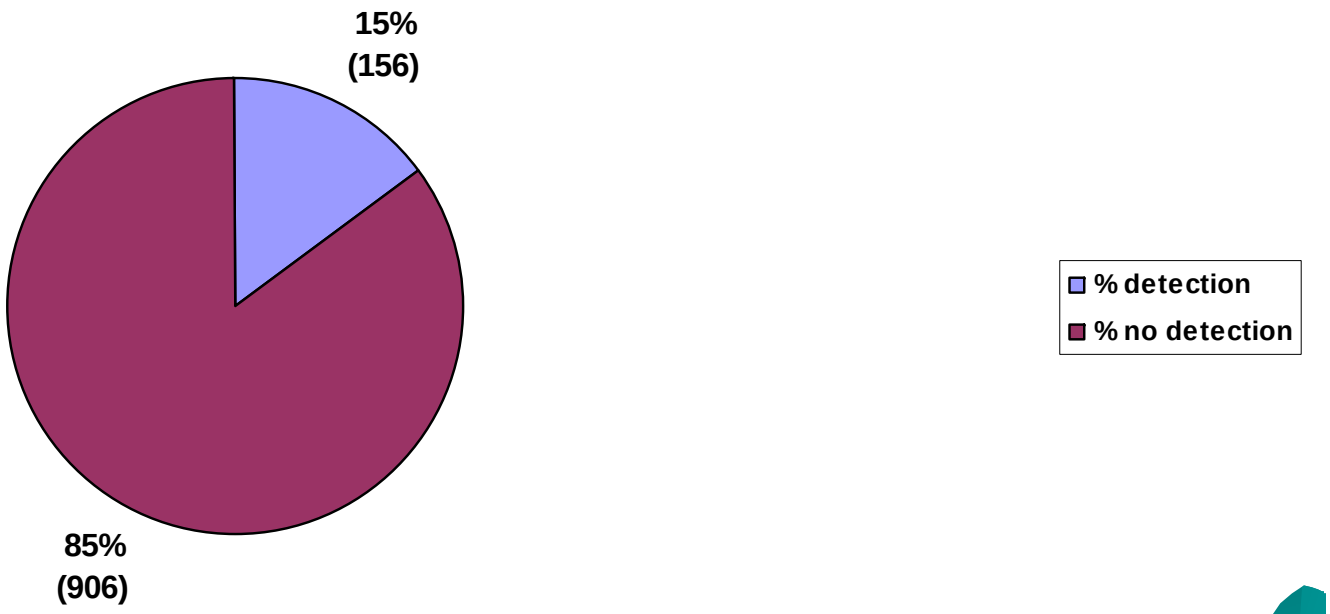
371 foliage samples tested for atrazine



Picloram

- 1062 samples analyzed for picloram
- Detected in 156 samples
- Not detected in 906 samples
- Percent detected – 15%

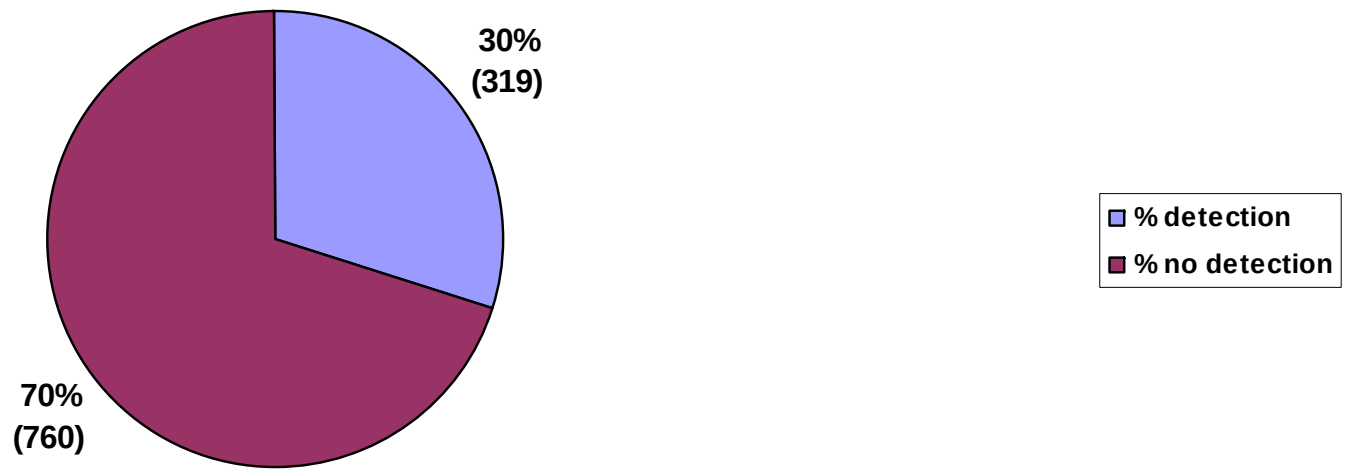
1062 foliage samples tested for picloram



MCPA

- 1079 samples analyzed for MCPA
- Detected in 319 samples
- Not detected in 760 samples
- Percent detected – 30%

1079 foliage samples tested for MCPA



Theory

- This information indicates that the theory does not hold true and if a pesticide is found in a sample, there is a source.

Questions or Comments?

- South Dakota Department of Agriculture.
- 605-773-4432