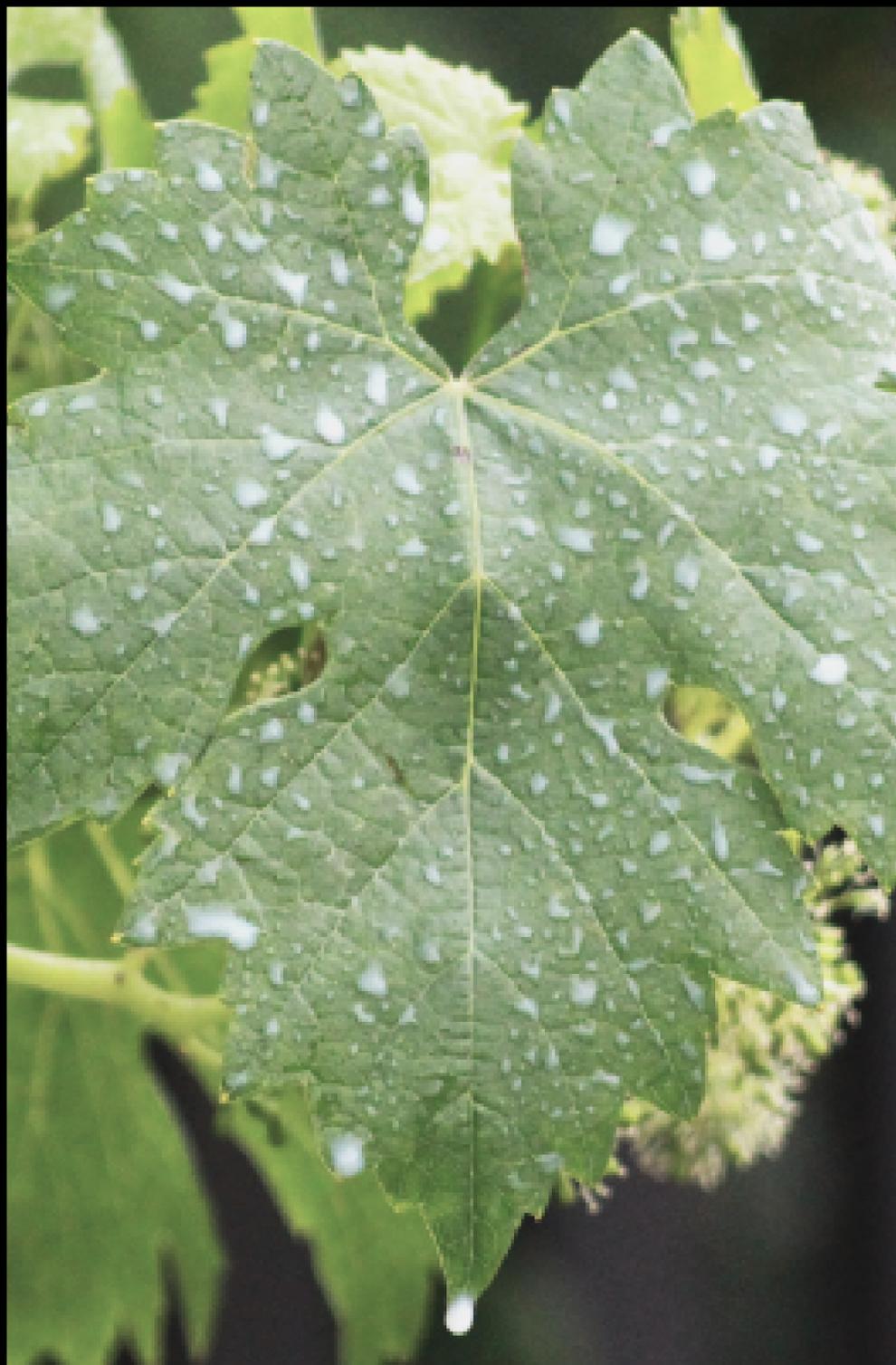




*GRATON
PESTICIDES
(GRAPE)
RESEARCH
PROJECT
RESULTS
2023*

Funded by
California Breast Cancer
Research Program



Graton Pesticides Research Partners

Sonoma Safe Ag Safe Schools

Californians for Pesticide Reform

University of California, San Francisco

United States Geological Survey

Breast Cancer Action

FUNDED BY

CALIFORNIA BREAST CANCER

RESEARCH PROGRAM



Graton Pesticides Research Team

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Graton, CA

Population: 1,700

All residential
water comes from
wells

23,000 Pounds of
Pesticides used
annually in and
around town of
Graton, CA

Breast cancer rates
in Sonoma County
are the 9th highest
in the state.



Graton Pesticides (GRAPE) Research Aims



Community Engagement

Build community dialogue regarding groundwater contamination and pesticide drift in agricultural regions, share the purpose and design of a health and exposure study, and provide information about study results, including ways to limit potential exposures.

Reconnaissance Research

Conduct a reconnaissance study of groundwater to characterize pesticide contamination and measure total estrogenic activity in domestic water supplies, deploy silicone bands at each sample site to test for pesticides in particle drift/dust, and characterize determinants of pesticide detections.

Evidence-Based Advocacy

Share the study design and results with farmers in the Graton area and other rural agricultural residential areas in Sonoma County to increase communication and understanding among stakeholders.

Graton Pesticides Research Study Selection Criteria



RECONNAISSANCE

6 households in Graton strategically selected for greatest vulnerability



PROXIMITY TO AGRICULTURE

Within 2 miles of agriculture/farms



WELL TYPE AND DEPTH

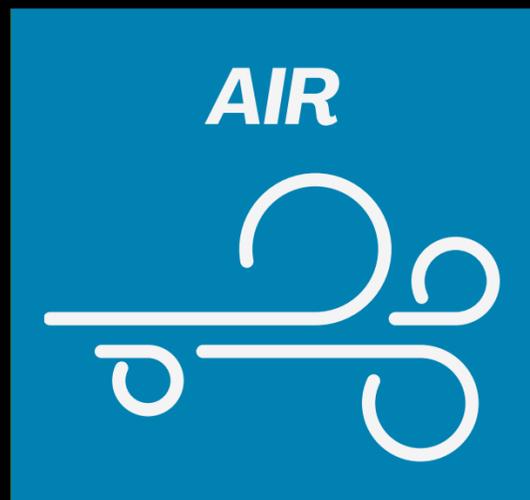
Hand-dug wells
Shallow well depths between 50-100 feet



LOT ELEVATION

Soil substrate
Ground water elevations and gradients

Graton Pesticides Research Methodology



Pesticide drift happens when droplets, vapor, or dust travel away from the target application site.

It can happen during and after the application and can spread distances more than 2 miles.

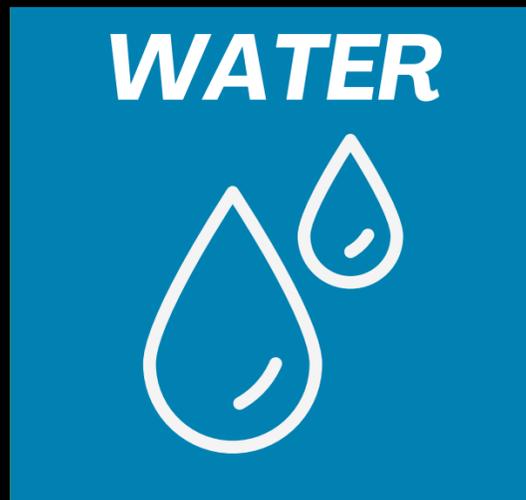
Sources of pesticide drift include agricultural, landscape, roadway maintenance, and residential use.

The sampling method used silicone bands secured in participants' yards for 1 month.

From April 3, 2021, through May 3, 2021, the bands collected pesticides, but were also subject to potential degradation from weather, etc. samples were tested by the U.S. Geological Survey (USGS) for 187 pesticides (including herbicides, insecticides, and fungicides).

These results do not include data for glyphosate, glufosinate, or aminomethylphosphonic acid (AMPA) as they were not available for this study.

Graton Pesticides Research Methodology

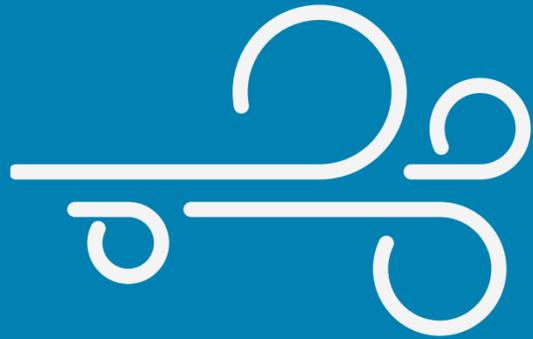


We sampled outdoor untreated well water and indoor tap water on May 3, 2021. Well depths ranged from 25–120 feet, two of which were hand-dug and four were drill-bored. Four sites were adjacent to agriculture and two sites were within one mile of agriculture.

Water samples were tested by the U.S. Geological Survey (USGS) for 187 pesticides (including herbicides, insecticides, and fungicides).

The USGS also measured for 57 potential endocrine disrupting chemicals and ran a bioassay screening for estrogenicity, which is the presence of estrogen hormones (estriol, estradiol, and estrone.)

AIR



General Findings

Ambient Air (Silicone Bands)

Pesticide drift was detected at all sites sampled throughout the community of Graton.

HERBICIDES

- Pendimethalin was detected at all six sites
- Dithiopyr was detected at Sites 2 and 3

FUNGICIDES

- Azoxystrobin: Sites 1 and 6
- Difenoconazole: Sites 1, 5, 6
- Propiconazole: Site 2
- Tebuconazole: Site 2
- Triflumizole: Site 2

INSECTICIDES

- Chlorantraniliprole was detected at Site 5

WATER



General Findings

Outdoor (Ambient Groundwater) and Indoor (Tap Water)

There were no pesticides detected that exceed drinking water or health advisory levels.

Estrogenic activity was observed at two sites.

HERBICIDES

- Trifluralin detected in the indoor tap water at Sites 1 and 2 at levels below health advisory standards

CONTAMINANTS OF EMERGING CONCERN

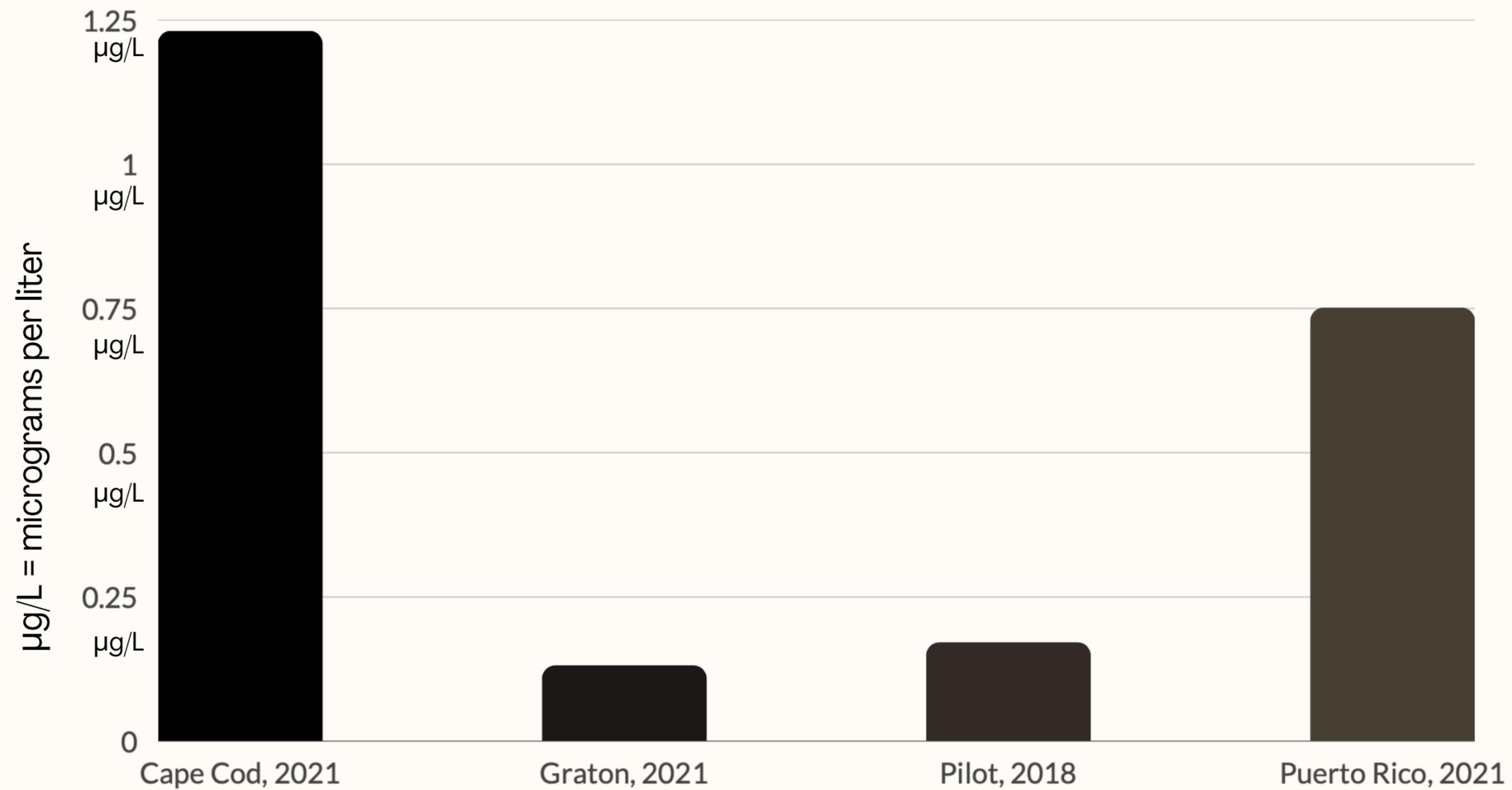
- Estrogenic activity detected at Sites 4 and 6

Site-Specific Findings

STUDY ID # (address is confidential)	AIR  Concentrations are in micrograms per band (µg/band)	WATER  Concentrations are in micrograms per liter (µg/L)
1	<u>Azoxystrobin</u> 0.0027 µg/band <u>Difenoconazole</u> 0.004 µg/band <u>Pendimethalin</u> 0.0036 µg/band	<u>Trifluralin</u> 0.0013 µg/L (tapwater)
2	<u>Dithiopyr</u> 0.001 µg/band <u>Pendimethalin</u> 0.0031 µg/band <u>Propiconazole</u> 0.0118 µg/band <u>Tebuconazole</u> 0.0117 µg/band <u>Triflumizole</u> 0.0047 µg/band	<u>Trifluralin</u> 0.0015 µg/L (tapwater)
3	<u>Dithiopyr</u> 0.0012 µg/band <u>Pendimethalin</u> 0.0020 µg/band	
4	<u>Pendimethalin</u> 0.0033 µg/band	<u>Estrogenicity</u> 0.00013 µg/L (groundwater)
5	<u>Chlorantraniliprole</u> 0.0011 µg/band <u>Difenoconazole</u> 0.0011 µg/band <u>Pendimethalin</u> 0.003 µg/band	
6	<u>Azoxystrobin</u> 0.0193 µg/band <u>Difenoconazole</u> 0.0329 µg/band <u>Pendimethalin</u> 0.002 µg/band	<u>Estrogenicity</u> 0.00006 µg/L (groundwater)

COMPARISON OF ESTROGENIC ACTIVITY IN TAPWATER IN UNITED STATES

The following chart details the range of estrogenicity detected in recent tapwater studies in the US



Interpreting the Results

It's reassuring that:

- None of the chemicals detected are known carcinogens or endocrine disruptors.
- The one chemical found in water samples, trifluralin, is a possible carcinogen but was present at levels below health advisory standards.
- Estrogenicity was present in two water samples but at levels lower than other studies.
- Glyphosate was not detected in water samples.

But it's worth noting that:

- There are over 86,000 chemicals used in the U.S. and not much is known about them.
- Likewise, only a small proportion of pesticides have been evaluated for carcinogenicity or studied for cancer risk.
- Breast cancer rates in Sonoma County for recent years are slightly higher than average rates in California, but not the highest. Detailed rates for Graton are unavailable.
- This was a small pilot study.



Questions & Answers



Next Steps



Thank You



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