Update of Collaborative Projects in WV Eastern Panhandle

- Berkeley County Water Resources Assessment and Fracture-Trace Analysis
- Jefferson County Water Resources Assessment and Fracture-Trace Analysis
- Morgan County Water Resources and Water Quality Assessment
- Orchard Arsenic and Changing Land Use in the Great Valley, Virginia and West Virginia

USGS
science for a changing world

Berkeley County Water Resources Assessment

- Assessment of Carbonate Aquifer Characteristics with Respect to Lineament Features

USGS
science for a changing world

Jefferson County Water Resources Assessment

- County-wide fracture-trace delineation and analysis of aquifer hydraulic properties at 200 sites in karst terrain

USGS
science for a changing world

Morgan County Water Resources Assessment

- Characterization of aquifer systems throughout Morgan County
- Hydraulic properties, major-ion chemistry, nutrients, and bacteria at 90 sites throughout county
- Trace metals (Ba, As, Al, Zn, and Br) and Ra-222 at 15 select sites

USGS
science for a changing world

Morgan County Water Resources Assessment Progress

- Approximately 80% of the field work is complete
- Aquifers typically produce in one or more fracture zones
- Initial results include high concentrations of manganese from shale aquifers
- Some wells have high concentrations of iron
- Bacterial counts are relatively low

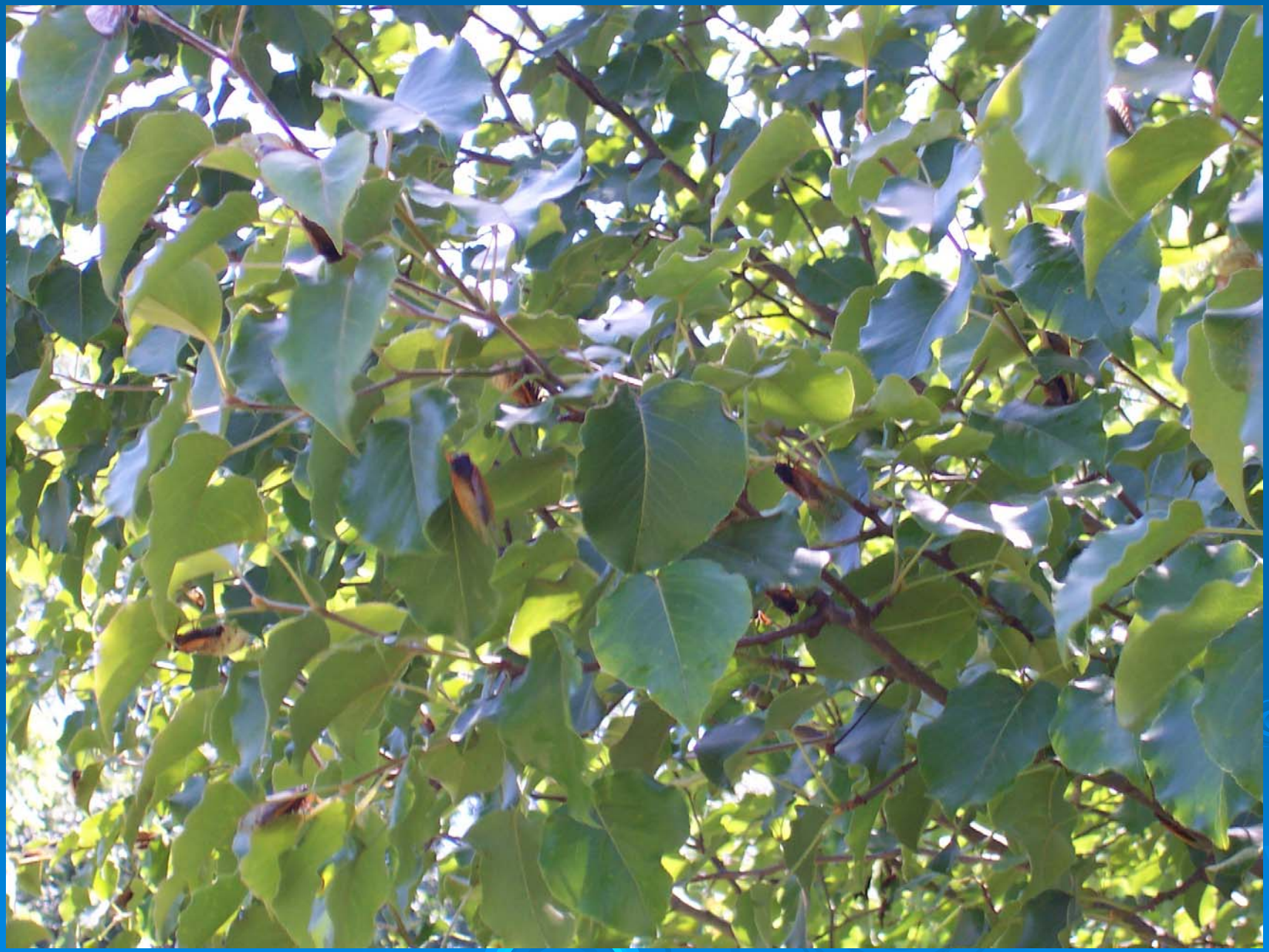
USGS
science for a changing world

Orchard Arsenic and Changing Land Use Study

- Overall objective is evaluation of residual arsenical pesticides and herbicides in a changing landscape
- Media examined include insect (Cicada) tissue and soil samples
- Supported by USGS Eastern Region and VA and WV Districts

17-Year Cicada Emergence Areas

from http://www.msj.edu/cicada/



Partial Objectives

- Do orchard soils where arsenical pesticides were used contain elevated concentrations?
- Can periodic cicadas be used as biomonitors of pesticide residues in soils?
- Do pesticide residues in cicadas pose a dietary threat to birds or other animals that feed upon them during emergence events?

Approach

- Sites located in Virginia and West Virginia eastern panhandle emergence areas
- Soil samples were analyzed
- Exoskeltons shed by nymphs analyzed
- Species and gender differentiation
- Whole body tissue analyzed for
  - Pb and As
  - Organochlorine pesticides

Initial Results

- Clear pattern of higher Pb and As in orchard sites
- Higher concentrations in exoskeltons
- No variance in trend by species or gender
- No apparent threat to birds or other animals consuming cicadas
- Organochlorine results not completed
- Detailed results will be published