

## Update from the Black Fly Lab - Elmer Gray

- A. Started at Clemson University in 1985
  - 1. Dr Noblet worked on Leucocytozoan research in the 70s
  - 2. Began doing field evaluation with Vectobac formulations
  - 3. Developed a shaker bioassay in 1990 for lab studies
  - 4. Initiated the Clemson colony in 1991
  - 5. Moved to UGA in 1999
  - 6. Only black fly colony in the world currently
    - a) Primary objective is R&D for Valent Biosciences
    - b) Black fly work only
    - c) Also ship materials to other labs
- B. Shaker bioassay
  - 1. Mimics pulse of Bti passing black fly larvae in streams and rivers
  - 2. Run controls, formulations at various concentrations, and high concentrations
  - 3. Determine LD50
- C. Fly colony
  - 1. Runway with flowing water
  - 2. Emergence hood when pupae are seen
  - 3. Place in oviposition containers
  - 4. Moist green cloth with light underneath to simulate grass over a stream
  - 5. Adults of this species are autogenous
  - 6. Egg papers placed on runway
- D. Colony is very labor and resource intensive
- E. Research
  - 1. Environmental factors affecting susceptibility of Simuliidae to Bti
    - a) Do antibiotics play a role - Environ Toxicol Chem 29
      - (1) Study showed antibiotics reduced enteric bacteria
        - (a) Lepidopteran larva showed reduced mortality to Btk after exposure to antibiotics
        - (b) Btk
          - i) Different modes of action
          - ii) Much slower action with leps
      - (2) No decrease was found with black fly
    - b) What about seston (particulate matter)
      - (1) Removed seston and tested Bti
      - (2) Saw reduced mortality when seston was added back
      - (3) Seston was full of diatoms
      - (4) Not all particulates have an effect
    - c) Diatoms and Bti efficacy - research is ongoing
    - d) Green algae work
  - 2. Spectrophotometer and Bti uptake
  - 3. Post-treatment evaluation
    - a) When is maximum mortality
    - b) When should you go out to evaluate how well your treatment worked
    - c) Dose does make a difference
    - d) Medium also makes a difference