Tackling fire ants, after a student death, a case study for school IPM in Texas.

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Abstract

In September 2013, a middle school student died after numerous fire ant stings during a junior high football game in Corpus Christi, TX. Allergic reactions to fire ant stings are rare, but require quick thinking and proactive first aid work. Shortly after this, Texas A&M AgriLife Extension school IPM program team was contacted to assist in reviewing the districts' IPM program, but also review the fire ant management program and make recommendations. The review came in two phases, one to assess the actual school IPM program under the TX Dept of Agriculture's school IPM rules, and the second phases was to review the fire ant management protocols and develop a new treatment protocol for the entire district. Corpus Christi ISD is located on the gulf coast of TX in a semi urban area. The district boasts it covers 63 square miles and has 37 elementary schools, 11 middle schools, 7 high schools, and 3 special campuses, with a total student enrollment of 39,414. To manage this, the district has one IPM Coordinator and 2 pesticide applicators and was using coaches to help with reporting fire ant mounds. After several meetings and revisions to the fire ant management plan for CCISD, the district implemented an improved fire ant management program in spring 2014. The result was they spent less money, have had fewer calls and complaints about fire ants and the coaching staff is now using more land than the 1.5 acres they were using for games.

Stinging Incident:

as reported by ABC News Reports

- September 2013, a 13 year old middle school student died after numerous fire ant stings during a junior high football game in Corpus Christi, TX.
- Student had been huddled with fellow football players during halftime of a football game when he began to scream, "Ants! Ants!"
- A coach ran over and attempted to squirt the ants off the students legs using a water bottle.
- Shortly after the 13-year-old lost consciousness and collapsed on the field.
- The student died after spending several days in an induced coma because of swelling in his brain.

Example of a fire ant sting—the pustule is the reaction most people get.

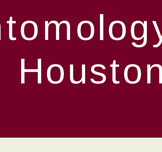


Image of fire ant venom sac as they are ready to sting

Fire Ant Management

Before incident by CCISD

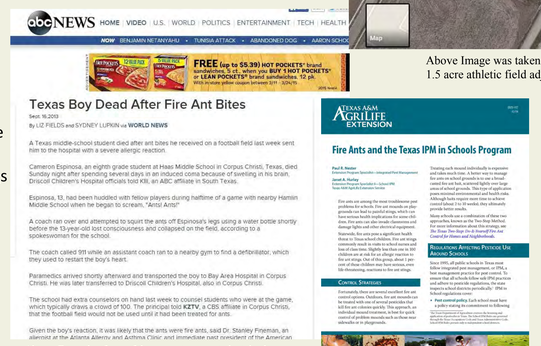
- Scheduled monthly inspections, supplemented with inspections by coaches/teachers.
- Generally, coaches called by telephone to report fire ants on a football field.
- This would generate a WO (work order) either before or after treatment and be entered on the technicians daily log.
- In general followed IPM thresholds and treated reported mounds utilizing mound drenches and a limited baiting area technique. Unless threshold was met, fire ants not treated in many instances.

Fire Ant Management

After Incident Before Baiting Program

- Personnel from CCISD facilities department and athletic department walked each field every day:
  - ⇒ Identify active mounds
  - ⇒ Treat active mounds
  - ⇒ Coaches walked fields again during PE classes
- Report active mounds
- Took several weeks to get fire ant mound densities low
- All middle school games moved to high school field complex, which was treated with Top Choice©

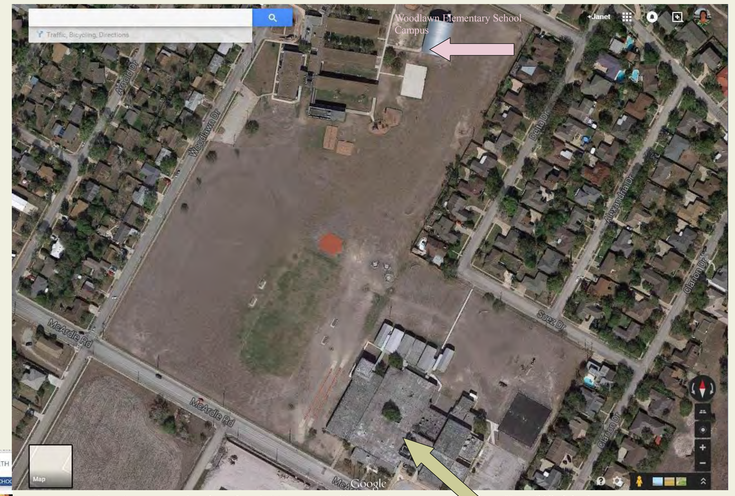
Images provided by Wizzie Brown, Paul Nester, Mike Merchant , and Google



Above: Example of one of the news story on student death
Right: Cover of Fire Ant Publication for Schools (updated after this incident

Texas A&M AgriLife Extension (Cooperative Extension Response)

- Corpus Christi ISD contacted Extension Program Specialist for School IPM, Janet Hurley on September 13, 2013 for assistance with responding to parents, teachers and school administrators regarding their IPM program.
- CCISD was sent a copy of the AgriLife Extension publication *Fire Ants and the Texas IPM in Schools Program*
- ◊ On October 1, 2013, Ms. Hurley conducted a site audit of CCISD's IPM program and reviewed their fire ant management protocols. This site audit was done in conjunction with a private firm who reviewed the District's emergency response protocol as well.
- ◊ The audit results were as follows:
  - ⇒ Education of CCISD employees about IPM program
  - ⇒ Parent notification about IPM efforts
  - ⇒ Distribute IPM program information district wide
  - ⇒ Proper posting to visibly display efforts
  - ⇒ Effective monitoring
  - ⇒ Pest sighting logs can be good monitoring
  - ⇒ Critiqued the present fire ant management effort
  - ⇒ Recommended proactive fire ant management strategy
- After Ms. Hurley's site visit, Dr. Paul Nester, Extension Program Specialist IPM and resident fire ant guru was asked to work with CCISD to review the district's current practices and make recommendations for future efforts.



Above Image was taken from Google Maps—you will notice the 1.5 acre athletic field adjacent to the middle school.

Above: Image of Dr. Paul Nester putting our fire ant bait using ATV with a Herd Spreader
Top Right Image: An example of what multiple mounds look like in a large field
Bottom Right Image: An example of what a new fire ant mound looks like, it's hard to see in daylight and hot temperatures

- Conducted phone conference with representatives from CCISD administration and Facilities and Maintenance Department addressing:
  - ⇒ Fire ant biology (life cycle, mounding, periods of activity, etc.)
  - ⇒ Fire ant control products
  - ⇒ Baits
  - ⇒ Long residual versus short residual products
  - ⇒ The need for a proactive plan not reactive plan
  - ⇒ Baiting Strategy (broadcast versus single mound treatments)
  - ⇒ Strategy of using long residual granule products with fipronil
  - ⇒ Use of properly calibrated application equipment

Critique of CCISD Fire Ant Control Program by Dr. Paul Nester

1) IPM Thresholds to trigger control (reactive approach) were in adequate for the CCISD situation
   - Identify active fire ant mounds
   - Focused on single mound applications
   - Once mounds were seen would react
   - Limited baiting area— were treating approximately 57.95 acres
   - Did not treat adjacent turf areas

Recommendations for CCISD fire ant control effort by Dr. Nester

- Stressed the use of proper application equipment
- Treatment of all the grounds with fire ant bait or fipronil granule
- Proper timing of applications for maximum effectiveness

New Fire Ant Management strategy for Corpus Christi Independent School District

1) Implemented a District wide fire ant baiting program for all campuses approximately 540.6 acres
2) The baiting program utilized:
   - Spring – Broadcast fire ant application (Extinguish Plus© chosen)
   - Summer – Broadcast fire ant application (Advion© chosen)
   - Fall – Broadcast fire ant application (Extinguish Plus © chosen)
   - Single mound treatments if needed for hard to control mounds
3) Most applications are made to campuses after hours, or on weekends with the products identified in spreadsheet. Spreadsheet developed by Brett Bostian lists each campus, net total acres, alethic acres (fields) and campus acres. Products and costs are listed in the spreadsheet as well.
4) Long residual fipronil granule (Top Choice© chosen), spread in February, is only utilized at the main competition sports complex, Cabaniss Field 6.9 acres.
5) All facilities are posted as required by Texas Department of Agriculture under the school IPM rules.

Impact—Results of new fire ant management program

The result since treating the entire campus:

- CCISD found the baiting approach to be extremely effective in reducing fire ants, and was pleased with the fire ant baiting program.
- CCISD **spent less money per unit area** of land for better fire ant management.
- After subsequent treatments with Extinguish Plus & Advion, **calls and complaints about fire ants in the district have become very limited**
- The **need for volunteers to check for fire ant mounds has disappeared** since there was a significant decrease in visible & active ant mounds after the 1st application.
- The **CCISD coaching staff is now using more land than the 1.5 acres** they were using for games.
- CCISD Facilities and Maintenance Department has **seen a greater than a 50% decrease in work orders for ants** with many of the work orders being for ants other than fire ants.
- 316 work orders for fire ants from July 2012 – September 2013 (21/month)
- 285 work orders for ants September 2013 – February 2015 (< 15/month, *50% of which were on other ants not fire ants*

Additional consequences as a result of this incident:

- Several districts changed their fire ant management practices—choosing to use baits on all campus property, not just athletic fields.
- Additional education for staff on fire ants, fire ant stings and first aid response.
- 84th Regular Session of Texas Legislature (2015)
  - Four (4) Bills were introduced—relating to the use of epinephrine auto-injectors on public and open-enrollment charter school campuses and at off-campus school-sanctioned events
  - Excerpt from Bills *"may maintain at each campus a supply of anaphylaxis medicine, including an epinephrine auto-injector, that may be administered to a person on campus or at an off-campus school event experiencing an anaphylactic reaction, regardless of whether the medicine or auto-injector was prescribed for that person. For anaphylaxis medicine to satisfy this subsection, the medicine may not have an expiration date that has passed."*