Meeting Minutes
For
Annual Meeting of Multistate Project S-1076:
Arthropod Management in Animal Agriculture Systems and Impacts on Animal Health and Food Safety

January 14-15, 2025

Chair – Brandon Smythe

Vice Chair – Cassandra Olds

Scribe – Phillip Shults

Local Arrangements – Justin Talley

Day 1

Meeting called to order by **Brandon G. Smythe** and **Cassandra Olds** who reminded participants that were are in the second year of the current 5-year project.

Next, **Cliff Lamb** addressed the group via zoom. He informed the group that they did not receive the last multistate award but that the application was highly ranked. **Cliff** will follow up to share comments on the award packet for potential resubmission of award which he recommended the group pursue. **Cliff** reminded the group leadership that the annual report must be updated (emphasizing accomplishments, impact, and publications) and uploaded to the portal. Minutes need to be uploaded within 30 days.

Action Item: Get comments on last year's multi-state award application from **Cliff**.

Brandon welcomed attendees and discussed meeting logistics. Each presentation update is 5 minutes with 2 minutes for discussion. **Cassandra** offered to help keep presentations on schedule. Prior to presentations, Brandon and Cassandra opened the floor for general announcements.

Justin Talley welcomed the group to Stillwater and discussed various items and events during the attendees stay. The group thanked Justin for his hospitality.

Nancy Hinkle announced a job opening at UGA in quantitative ecology. **Erika Machtinger** announced a public health entomology and a vector extension position open at Penn State. **Jeff Scott** and **Gary Brewer** both announced their upcoming retirements.

Following a small intermission, **Michelle Colby** provided her NIFA Update. **Michelle** informed the group that Dr. Amber Campbell is the new National Program Leader (NPL) and that the strategic plan is on the website, with the current plan running through 2026. Current program highlights and requests for applications (RFAs) for 2025 are available. Visit the NIFA website or email **Michelle** for details.

Agriculture and Food Research Initiative (AFRI) RFAs: Education and Workforce Development, Agricultural Biosecurity A1181 (diagnostic- and network-based programs), AFRI Foundational and Applied Science (FAS), and non-AFRI programs.

Michelle reminded the group that more information with regard to upcoming RFAs, meetings, and webinars, they could visit www.nifa.usda.gov/events. **Michelle** also urged the group members to consider volunteering to be a panelist.

Under continuing resolution, funding for awarded RFAs may depend on congressional appropriations. Reviewing previously awarded applications is helpful for understanding project types that get funded.

Cassandra and **Phillip Shults** led the discussion for **Objective 1: Investigate the distribution, ecology and biology of arthropods of veterinary concern.**

Erika presented research investigating interactions between lone star ticks and blacklegged ticks on deer. Lone star tick feeding may negatively impact blacklegged tick feeding. Severe reactions observed when blacklegged ticks feed after two rounds of lone star tick feeding. Expanding the study next year.

Lauren Beebe presented findings evaluating stable fly host association utilizing blood meal analysis. A total of 22 species identified.

Becky Trout-Fryxell presented her efforts exploring wildlife associations with the longhorned tick around cow-calf operations. Raccoons, possums, and chipmunks contribute to longhorned tick dispersal and survival.

Emrah Ozel presented work examining pathogen prevalence and pyrethroid resistance in brown dog tick populations. Similar pathogen rates found across Texas; high numbers of resistance alleles detected in South Texas.

Xinyue Huang presented work that characterized glutamate-gated chloride channels in cattle fever ticks. Conducted homology modeling of protein structures, compared isoforms, and analyzed binding affinity and expression levels.

Tyler Chan presented work that conducted transcriptomic analysis of stable flies. Found downregulated genes after blood feeding and investigated methods for genetic sexing.

Phillip Shults presented work that studied sex determination in *Culicoides*. The new *Culicoides sonorensis* genome assembly achieved at the chromosome level. Putative site for male-determining locus identified.

Pia Olafson investigated REMOTE use in stable flies. GFP efficiently incorporated into oocytes, but the technique failed in horn and face flies. Next step: creating a phenotypic genetic transgene for stable flies.

David Luecke developed sex-specific chromosome-scale assemblies for five muscoid pest flies. Investigating M locus in multiple species. Encouraging collaboration (David.Luecke@usda.gov).

Rich Meisel compared house fly microbiomes across genotypes. Temperature and genotype affected microbial beta diversity, with temperature playing a larger role.

Victoria Pickens researched antimicrobial resistance (AMR) on cattle operations. Flies carried AMRs at similar rates and compositions to environmental samples, with phenotypes varying by location. AMRs in flies were diverse but correlated with specific farms.

Amy Murillo identified genomic regions associated with thermal traits in blowflies. Males exhibited higher cold tolerance, while heat tolerance was similar across sexes.

Herman Griese examined house fly responses to antibiotics. High doses inhibited fly development into adulthood.

Travis Rusch studied the thermal ecology of flies, including oviposition preferences in house flies. Plans to expand to other pests and vector species.

Brandon Hall investigated behavioral impacts of bluetongue virus (BTV) infection in midges. Infected midges showed light trap aversion, possibly due to viral dissemination into the eyes.

The group broke for lunch**.**

After lunch, **Gary Brewer** and **Dave Boxler** led the discussion of **Objective 2: Develop and implement pest management systems to protect animal health, welfare, and productivity**. **Cassandra** assisted with loading presentations and leading discussions.

Gary Brewer explored black soldier fly's potential for biological control. Stable fly survival was unaffected in co-infestation lab assays, but field studies showed reduced stable fly emergence.

Erica Machtinger surveyed Pennsylvania horse owners on tick issues. Found mainly American dog ticks. PPE like horse boots and masks reduce tick pressure effectively.

Cassandra Olds used accelerometers to measure fly pressure on horses. The method effectively quantified pest fly pressure and tested treatment efficacy.

The group stopped discussion of Objective 2 to allow for special presentation by **Sara Delheimer** who attended the meeting via zoom to discuss Multistate Research Fund Impact Statements. **Sara** presented a workshop on crafting impactful accomplishments and impact statements. Good statements address an issue, summarize actions taken, highlight findings or outputs, and explain resulting changes. Multistate impacts should emphasize collaboration. **Sara** provided interactive examples utilizing group feedback to highlight various approaches to crafted impactful statements and fielded questions from the group members to clarify individual topics. Workshop slides were provided to group leadership and were made available to members..

The group took a short 10 minute break. Following the break, the group continued discussion on **Objective 2: Develop and implement pest management systems to protect animal health, welfare, and productivity (continued)**

Caleb Hubbard used sensors to monitor cattle behaviors associated with fly pressure. Behavioral signatures were correlated with sensor data. Sensors were tested to evaluate fly mitigation methods.

Chris Geden improved production methods for the parasitoid *Tachinaephagus zealandicus*. Enhanced diets increased parasitoid yields.

Dave Boxler tested water-based garlic formulations for pest fly control. A 25% garlic solution showed strong repellence against horn flies.

Ted Burgess and Alden Estep then led discussion of **Objective 3: Develop and strengthen insecticide resistance surveillance of arthropod pests of veterinary concern and associated arthropod-transmitted pathogens. Cassandra** assisted with loading presentations and leading discussions.

Alec Gerry Presented work that showed Bacillus spp. did not control immature house flies in larval media.

Dana Nuydach researched house fly resistome and its potential as a xenosurveillance tool. Multistate members are collecting house flies from feedlots.

Ted Burgess introduced rhPCR for SNP detection in insecticide resistance monitoring. The method is cost-effective, accurate, and time-efficient.

Jimmy Pitzer investigated adult house fly susceptibility to insecticidal bait after larval exposure. Results were inconclusive for adult survival.

Pia Olafson and **Becky Trout-Fryxell** led the discussion of **Objective 4: Develop precision innovations for economically beneficial management of arthropods of veterinary concern. Cassandra** assisted with loading presentations and leading discussions.

Katy Smith enhanced S.M.A.R.T. surveillance for pest detection on cattle. Computer models trained in tick images are limited to counting but aim to reduce human intervention. Field validation is planned.

Justin Talley developed binomial sequential sampling for horn flies on cattle. Evidence suggests current thresholds may underestimate populations.

Josh Jackson used AI technologies to enhance tick identification and pathogen surveillance. IDX system effective for unfed adult ticks; further work needed for engorged ticks.

Alec Gerry and Erika Machtinger then led the discussion of **Objective 5: Develop and deliver science-based educational materials focused on the management of arthropods of veterinary concern. Cassandra** assisted with loading presentations and leading discussions.

Becky Trout Fryxell discussed REEU funding for veterinary entomology research. Eight scholars will conduct summer research at multistate institutions.

Katy Smith developing training programs for stakeholders, with evaluations planned post-training.

Rich Meisel introduced Houston Genetics Research Experiences for Teachers.

Alec Gerry updated VetPestX. The new version will pull information from databases automatically and feature improved displays.

Cassandra Olds proposed a regional extension cooperation network for veterinary entomology.

Nancy Hinkle stressed using media relations to disseminate research findings.

Erika Machtinger encouraged increased participation in S1076 initiatives.

Closing remarks made by **Brandon, Cassandra** and **Justin**. Meeting Adjourned at 4:30 PM.

Day 2

Brandon and **Cassandra** welcomed everyone and provided an overview of the second day's agenda. **Justin** discussed logistics of getting to and from the campus to tour the tick rearing facility.

Brandon and **Cassandra** led the **business meeting**. A request for the 2026 hosting responsibility was sought. **Chris Geden** offered Orlando as the location of the next meeting. The group was unanimously in favor of this. January 12-16, 2026, was floated as the tentative dates. Group members were reminded that somewhere in the Western time zone would be the location of the 2027 site.

There was a discussion about how we can improve the annual report. The impact workshop gave great ideas, and it was decided to better emphasize accomplishments and outputs. A google drive will be set up for members to upload all the relevant publications.

Alec Gerry proposed a discussion about VetPestX. **Alec** will be cleaning up some of the search parameters to make the site more usable. There are some redundant search terms that might make someone miss a product that would have been relevant. There were many suggestions such as an option to select multiple pests or hosts or a sort function on the products page. **Alec** wrote down

our suggestions for improving the website and will see how many are feasible. **Alec** wants to leverage the meeting to support the website. Discussion will be built into the next meeting.

Casandra passed around a signup sheet for those interested in starting a veterinary entomology extension working group.

Phillip Kaufman is looking for people to collect lesser meal worms. His collaborator needs 2 or 3 sites to collect on chicken farms. He will send an email to follow up.

Ted Burgess is requesting help looking at ectoparasites on cow-calf operations. Collaborators interested should email **Ted**.

It was decided to reapply for the multistate award again this year. The first step is to get feedback from the last application from **Cliff**.

Justin Talley proposed that we discuss emerging technologies in the field. **Cassandra** wants to see better ways of monitoring the pest pressures. **Gary** supports the idea of using drones and ai for these purposes. We could use **Becky's** NIFA grant that supports undergraduate research, as small pilot studies for ideas that need to be investigated further.

There need to be better ways to reach the stakeholder. Connecting with veterinarians seems to be one of the best ways of disseminating information to producers. VetPestX could be a great way to direct people to resources. **Justin** emphasized the need to go to the producer meetings. **Pia** mentioned inviting the research liaisons or representatives from these organizations to our meetings.

Business meeting summary

1. Orlando was unanimously selected as the next meeting location (January 12-16, 2026). Western time zone proposed for 2027.
2. Annual report improvements: Members will upload relevant publications to a shared Google Drive, emphasizing accomplishments.
3. VetPestX updates: Improved search functionality and usability discussed.
4. Collaboration requests:
    - **Ted Burgess**: Ectoparasite studies on cow-calf operations.
    - **Phillip Kaufman**: Lesser mealworm collections on chicken farms.
5. Emerging technologies: Discussed drones, AI, and NIFA-funded research to enhance pest monitoring.
6. Outreach: Suggested engaging veterinarians and attending producer meetings. Proposed inviting research liaisons to future meetings.

Meeting adjourned at 10:40 AM.