Project Apis m.

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REQUEST FOR PROPOSALS

PROJECT *APIS M.* ON BEHALF OF THE NATIONAL HONEY BOARD

September 1, 2023

Background

Managed honey bees in North America continue to be under increasing pressure to meet pollination demands for our food supply. At the same time, annual colony losses are increasing- 48.2% in the US in 2022, and the natural forage which gives bees healthy nutrition and a honey crop for producers is decreasing. Colony losses are often attributed to pathogens, parasites, pesticides, hive management (queen mating, genetics, maintenance), climate, and available nutrition. United States honey production in 2022 from producers with five or more colonies totaled 126 million pounds, down 1% from 2021 .Sustainable beekeeping is dependent on maximizing outputs (colony health, colony numbers, pollination contracts, honey production, profitability) while minimizing the inputs (time, money, personnel, treatments). A sustainable beekeeping industry contributes to a more sustainable agricultural landscape through a stable supply of bees for crop pollination. Therefore, Project *Apis m.* (PAm) is requesting research proposals that focus on enhancing the health, survival, and productivity of honey bee colonies, which provide practical and tangible solutions to the beekeeping industry.

The funding sponsor for these proposals is the National Honey Board (NHB), with PAm administering the proposal, funding process, and award accountability. PAm administers several other initiatives with funding from many sources, including corporate sponsors, private donations, and grants. Past proposals received and funded by PAm and NHB reflect a similar focus on supporting the industry.

The National Honey Board is an industry-funded agriculture promotion group that works to educate consumers about the benefits and uses for honey and honey products through research, marketing, and promotional programs. Project *Apis m.* is the largest non-governmental, nonprofit honey bee research organization in the USA. Established by beekeepers and almond growers in 2006, PAm has infused over $11 million into bee research to provide beekeepers with healthier bees resulting in better pollination and increased crop yields.

Priority Areas for Funding

With this call for research proposals, PAm is requesting proposals for research addressing honey bee health, nutrition, and productivity. Priority will be given to proposals which aim to produce solutions to industry problems. Current specific areas of interest include:

Pollination

Address practices for sustainable profitability of beekeeping and the provision of pollination services to agriculture

- Address gaps in crop pollination and colony density economics, including stocking rates, land use and landscape level comparisons.
- Assess 'bee friendly' agricultural practices for impact, like cover crop efficacy and management studies including seed composition, implementation, establishment, termination, soil benefits, pest/pathogen reduction/beneficial insect use, frost, irrigation, economics, colony health and productivity etc.

Varroa

- Genetic tools to identify, predict and select Varroa resistant bees, and using mite genetics in control strategies
- Develop new technologies for Varroa detection, prediction, treatment, and control
- Test new compounds and potential controls, ideally to deliver tools that control Varroa at all temps without harmful residues
- Develop BMPs to explain "how to select for Varroa resistance" and detail effective, year-long, region-specific Varroa management
- Studying and developing innovative management techniques, such as indoor bee storage, and/or adapting techniques for different regions.

Nutrition & Forage

- Address gaps in our knowledge of honey bee complete nutrition
- Test and develop supplements for benefits, economics, nutritional chemistry
- Create annual BMP style programs of forage and supplements (region and season specific)
- Develop data driven forage "how-to's" for various audiences. Include economics of forage, optimizing utility and impact for growers, beekeepers, and bees
- Study bee competition, land categorization and differentiation of public lands for the purpose of honey bee pasture, pollinator carrying capacity; document honey bee and wild bee interaction; research and test supplemental forage and specific management strategies that support and allow for coexistence of honey bees and native bees on various landscapes

Pesticides

- Determine pesticide effects on bees outside of required regulatory testing, including cumulative or sub lethal impacts, tank- mix combinations, and adjuvants that are applied to bee-attractive crops
- Develop mitigation approaches to reduce pesticide impacts on bees through (1) reducing bee toxicity of pesticides through phytochemicals, (2) reducing bee exposure through repellents and supplemental feeding and (3) reducing exposure during application through precision agriculture or other application innovations
- Measure pesticide exposure and risk in colonies throughout the year in different crops and foraging scenarios

Queen Quality

- Define queen quality metrics– refine understanding of what is 'normal', define measures, methods, and genetic markers
- Study queen vs. hive interactions to understand and parse queen vs. hive factors that affect queen longevity
- Develop and improve bee genetics for commercial scale beekeeping (e.g., Varroa resistance)

- Provide a BMP-style certification, informed by current behavior change methods research, to improve and optimize breeding, shipping, and requeening

Emerging Issues

- Investigate specific, sudden, or otherwise unusual colony loss events
- Assess or address specific emerging problems or pests of concern, through testing and outreach.

Other projects may be considered, and research outside the U.S. is possible (all application materials must be in English). The goal of this research is to help producers maintain colony health and honey production. Multi- and single-year proposals will be considered. The amount of funds available for a particular proposal will depend on the number and merit of successful proposals. The submission guidelines are based on the format requested by PAm; they can be reasonably short and must include the items specified in the guidelines below.

Proposals must be submitted to Project *Apis m.*'s online portal hre by midnight (PDT), October 1, 2023. Copies of proposals will be reviewed by the PAm Scientific Advisory Committee and the PAm Board of Directors.

Submission Guidelines

Please limit proposals to 5 pages of project description (e.g., introduction, relevance to beekeeping industry, background, aims/objectives, experimental plan, expected results, potential pitfalls and solutions, plan to disseminate information, summary), and **10 pages total** (including budget justification, PI information, etc., but excluding references).

Required elements include:

1. **Title, Principal Investigator, Date** – Clearly state the title and principal investigator (PI) of your proposal. Provide the PI's title, address, email address and telephone number. List cooperating investigators and beekeeping businesses with their names and email addresses. Cooperating investigators and beekeepers must be aware of this proposal. If cooperating investigators or beekeepers are contacted by PAm and are unaware that their names have been added to the proposal, the proposal will not be considered. Please include date of submission.
2. **Information Regarding Prior or Simultaneous Submissions** – Proposals submitted to NHB/PAm that have been previously or are concurrently submitted to other funding organizations (e.g., USDA, NSF, etc.) must indicate which organization(s) have reviewed (and/or are simultaneously reviewing) the proposal and must include a maximum one-page summation of that review process (e.g., changes made to address reviewers' concerns).
3. **Date and Duration of Proposed Study - Project Timeline** – The proposed project timeline should begin early in 2023. Include proposal details for the anticipated duration of the study as well as planned submission of updates and final report to PAm.
4. **Problem and Significance** – To provide a background to the proposed study, state the problem the study addresses and its significance to managed honey bee colonies and/or pollinated crops. If this is a continuation of a previous PAm or NHB project, please state the title and funding provided in the previously funded project, the outcome of the previously funded project and justification for continuing research.
5. **Objectives / Specific Aims** – Clearly outline the objectives of the project.

6. **Experimental Design / Materials and Methods** – Describe the experimental approaches that will be utilized to address the specific aims, detail the specific methodology that will be utilized to address the project's objectives. This description should be scientifically sound and include logically linked experiments. Include preliminary data when possible. Please address the feasibility of the project and include potential pitfalls and solutions when necessary.
7. **Intended Outcome** – Give a brief statement of the intended outcome of the project. This may be used to better describe your project in a press release or website, it should blend the objectives into a concise summary of the project while providing the bottom-line justification for its funding.
8. **Dissemination of Findings, including publications and presentations** – Indicate the plan to present findings at professional meetings, conferences, and in publications (be specific). In addition, clearly state how you will share this information with beekeepers.
9. **Budget Request** – Include a) salaries and benefits, b) supplies, c) equipment, and d) travel. If applicable, list other entities funding this research and the amount they are contributing. If this proposal is being submitted for consideration by other organizations, please list the organization and the amount requested. PAm and NHB policy is consistent with California commodity groups; we do not pay overhead or indirect costs. (These, typically, are expenses such as rent, utilities, depreciation, insurance, administrative or miscellaneous supplies, legal or accounting services, salaries/wages allocated to the project for persons not working directly on the project.) If proposal is for matching funds, then NHB/PAm funds will not be released unless the PIs obtain funding for the entire project and/or clearly state how PAm funds would be utilized independent of additional funding.
10. **Economic Feasibility for New Products** – If the study involves new product development, please provide economic evaluation of the new product. This would include projected cost of the final product. Justification for the projected cost and cost- effectiveness will be a prime consideration in evaluating the proposal.
11. **Information regarding correspondence with PAm or NHB** members regarding the project prior to proposal submission.
12. **References** – Provide literature references pertinent to your proposal. Letters of Support can be included but are not required.

Selection Criteria

A Review Committee comprised of PAm and NHB representatives will review proposals and make decisions based on the following criteria:

1. Compatibility of the research objectives outlined in the project description with priority areas and focused on solving problems relevant to the commercial beekeeping industry.
2. Likelihood of obtaining practical/usable results for the beekeeping industry.
3. Overall scientific merit and originality, including the project's strengths and weaknesses.
4. Use of adequate experimental approaches, inclusion of logically linked experiments and project feasibility.
5. Inclusion of an assessment of the potential pitfalls (or risks) associated with the project and alternative strategies to mitigate those risks.
6. Inclusion of unique strategies, sustainable solutions, or establishment of knowledge that will lead to sustainable solutions in the long-term.
7. Likelihood of success (i.e., PIs credibility, record of success, experience with techniques, relevant cooperators, etc.).

8. Adequate indication that PI(s) will communicate their findings to commercial beekeepers.
9. Economical and adequate budget for proposed research.
10. Proposed dissemination of findings.

Approval and Funding
PAm will notify the PI shortly after funding decisions are made by the PAm Board of Directors, which are anticipated by December 2023. Unless other terms are stated, 75% of the requested funding will be provided at the commencement of the study, with the remaining 25% disbursed upon receipt of the final report.

Expectations
PAm and NHB assume projects will be executed as stated in the proposal, specifically with reference to the defined objectives, timeline, and budget. Successful applicants will sign an agreement with PAm. Interim and annual reports will be provided to PAm, which will then be forwarded to NHB. Every award recipient is asked to acknowledge funding sources (PAm and NHB), as well as share progress and findings with the beekeeping industry in part by providing public-facing updates with interim and final reports that will be searchable in Project Apis m.'s research database.

Questions Contact patty@projectapism.org with brief questions concerning submission of proposals to Project *Apis m.*