

**RESEARCH AND OPTION AGREEMENT  
NAS ID Number 38**

**I. PARTIES**

THIS CONTRACT is made and entered into by and between the STATE OF FLORIDA, DEPARTMENT OF CITRUS, whose address is Post Office Box 148, Lakeland, Florida 33802, hereinafter referred to as "**DEPARTMENT**," and CORNELL UNIVERSITY whose address is 373 Pine Tree Road, Ithaca, New York 14853, hereinafter referred to as "**UNIVERSITY**."

**II. STATEMENT OF PURPOSE**

Whereas the Florida citrus industry is a significant contributor to both the state and national economies and faces increasing costs and risks through a combination of factors related to labor, the environment and infectious diseases, and seeks to improve its outlook for survival and profitability by collectively investing in innovative research and development through a competitive, peer-reviewed research sponsorship program;

Whereas, the **UNIVERSITY** is a leading instructional research institution devoted to the public good through its status as a non-profit, tax-exempt, educational institution, and has significant expertise and resources related to citrus production;

Whereas, both the **DEPARTMENT** and the **UNIVERSITY** recognize the need for significant follow-on investment before discovery research findings can be optimally and expeditiously translated into commercial applications for the public benefit;

Whereas, the research program contemplated by this CONTRACT is of mutual interest and benefit to **DEPARTMENT** and **UNIVERSITY**;

Now, therefore, in consideration of the premises and mutual covenants herein contained, the parties hereto agree to the following:

**III. SCOPE OF SERVICES**

In order to fulfill the statements as outlined in Section II, the parties agree as follows:

**1. DEFINITIONS**

As used herein, the following terms shall have the following meanings:

A. "Project" shall mean the description of the project, under the direction of the principal investigator (University project director) found at the Florida Citrus Production Research Advisory Council (FCPRAC) website URL: <http://www.fcprac.com> where the quarterly updates and annual reports are to be submitted.

B. "University Intellectual Property" shall mean, individually and collectively, all inventions, improvements and/or discoveries which are conceived and reduced to practice by one or more employees of **UNIVERSITY** in the performance of Project.

C. "Option" shall mean the right of the **DEPARTMENT** to elect to receive for consideration, a royalty-free, non-exclusive license, geographically limited to the State of Florida, to make, have made, use, sell, have sold and offer for sale Licensed Products in the field of use defined as citrus while claims contained in the University Intellectual Property are unexpired or pending.

D. "Licensed Products" shall mean any product or part thereof developed by or on behalf of a **UNIVERSITY** that:

1) is covered in whole or in part by an issued, unexpired claim or a pending claim contained in the University Intellectual Property, in any territory in which any product is made, used or sold; or

2) is manufactured by using a process which is covered in whole or in part by an issued, unexpired claim or a pending claim contained in the University Intellectual Property, in any territory in which any such process is used or in which any such product is used or sold.

E. "Business Partner" shall mean any person or entity with which **DEPARTMENT** has a written agreement with obligations relating to the joint development, distribution or marketing of Licensed Products in a collaborative manner, rather than merely a grant of sublicense under the University intellectual property rights.

## 2. **RESEARCH WORK**

A. This CONTRACT is with **UNIVERSITY**, and **UNIVERSITY** agrees that Dr. Kerik D. Cox will be the Principal Investigator for the project, "Management of Psylla in Tree Fruit Crops Using RNA Interference." In the event that the Principal Investigator becomes unable or unwilling to continue Project, and a mutually acceptable substitute is not available, **UNIVERSITY** and/or **DEPARTMENT** shall have the option to terminate said Project.

B. **UNIVERSITY** shall commence the performance of Project promptly after the effective date of this CONTRACT, and shall use reasonable efforts to perform such Project substantially in accordance with the terms and conditions of this CONTRACT. Anything in this CONTRACT to the contrary notwithstanding, **DEPARTMENT** and **UNIVERSITY** may at any time amend Project by mutual written agreement. Amendments to total Project costs and other material terms may be subject to final approval by the Florida Citrus Commission.

3. **REPORTS, CONFERENCES & PUBLICITY**

A. **UNIVERSITY** shall provide brief, single-page quarterly updates which shall summarize progress in the preceding three (3) month calendar periods and are due on July 15, October 15, and January 15. The first quarterly report shall include progress from date of execution through June 30. Annual reports are due thirty (30) days after the year anniversaries of the Project awards. Awardees should detail progress towards stated milestones including a summary of the relevant intellectual property, data sharing with the scientific community, and steps toward possible commercial applications. The quarterly updates and annual reports are to be submitted to the FCPRAC website URL: <http://www.fcprac.com/reports.html>.

B. During the term of this CONTRACT, representatives of **UNIVERSITY** will meet with representatives of **DEPARTMENT** at times and places mutually agreed upon to discuss the progress and results, as well as ongoing plans, or changes therein, of the Project to be performed hereunder.

1) **DEPARTMENT** will not use the name of **UNIVERSITY**, nor of any member of **UNIVERSITY'S** Project staff, in any publicity, advertising, or news release without the prior written approval of an authorized representative of **UNIVERSITY**.

2) **UNIVERSITY** will not use the name of **DEPARTMENT**, nor of any employee of **DEPARTMENT** in any publicity, advertising, or news release without the prior written approval of an authorized representative of **DEPARTMENT**. This limitation does not include **UNIVERSITY'S** internal documentation that identifies the existence of this CONTRACT. **UNIVERSITY** will not, under any circumstances, advertise or otherwise state or imply that **DEPARTMENT** has tested and/or approved any product or process.

C. **DEPARTMENT** recognizes that under **UNIVERSITY** policy, the results of **UNIVERSITY** Project must be publishable and agrees that Researchers engaged in Project shall be permitted to present at symposia, national, or regional professional

meetings, and to publish in journals, theses or dissertations, or otherwise of their own choosing, methods and results of Project, provided, however, that **DEPARTMENT** shall have been furnished copies of any proposed publication or presentation as early as possible but no later than at the time of submission.

#### 4. **INTELLECTUAL PROPERTY**

A. All rights and title to University Intellectual Property under Project shall belong to **UNIVERSITY** and shall be subject to the terms and conditions of this CONTRACT. Rights to inventions, improvements and/or discoveries, whether patentable or copyrightable or not, which do not relate to Project and are made solely by employees of the **UNIVERSITY** shall belong to **UNIVERSITY** and shall not be subject to the terms and conditions of this CONTRACT. **DEPARTMENT** acknowledges that **UNIVERSITY** may develop inventions, improvements, and/or discoveries, whether patentable or copyrightable or not, outside of the Project.

B. Rights to inventions, improvements and/or discoveries, whether patentable or copyrightable or not, relating to Project made solely by employees of **DEPARTMENT** shall belong to **DEPARTMENT**. Such inventions, improvements, and/or discoveries shall not be subject to the terms and conditions of this CONTRACT.

C. **UNIVERSITY** will promptly notify **DEPARTMENT** of any **UNIVERSITY** Intellectual Property conceived and made during the Contract Period under Project. While **UNIVERSITY** shall be responsible for making decisions regarding scope and content of application(s) to be filed and prosecution thereof, or for other intellectual property protection to be filed, **DEPARTMENT** shall be given an opportunity to review and provide input thereto. **UNIVERSITY** shall keep **DEPARTMENT** advised as to all developments with respect to such application(s) and shall promptly supply to **DEPARTMENT** copies of all papers received and filed in connection with the prosecution thereof in sufficient time for **DEPARTMENT** to comment thereon. **DEPARTMENT** shall cooperate with **UNIVERSITY** to assure that such application(s) will cover, to the best of **DEPARTMENT'S** knowledge, all items of commercial interest and importance. **UNIVERSITY** shall bear all costs incurred in connection with such preparation, filing, prosecution, and maintenance of U.S. and foreign application(s) directed to said University Intellectual Property.

D. If **DEPARTMENT** elects not to exercise its Option, **UNIVERSITY** shall be free to continue prosecution or to maintain any such application(s), and to maintain any protection issuing thereon in the U.S. and in any foreign country at **UNIVERSITY'S** sole expense and with no further obligation to **DEPARTMENT**.

5. **GRANT OF OPTION RIGHTS AND PAYMENT**

A. Pursuant to Section III.4.C, **UNIVERSITY** grants **DEPARTMENT** the option, for consideration of a fully paid-up, royalty-free, non-exclusive license, geographically limited to the State of Florida, to make, have made, use, sell, have sold and offer for sale Licensed Products in the fields of use during the term of the CONTRACT.

The grant of section III.5.A includes the right of the **DEPARTMENT** to sublicense solely to its Business Partners. The **UNIVERSITY** may request that the **DEPARTMENT** elect to exercise its Option at any time after the filing of a non-provisional US patent application or other intellectual property protection to be filed. The option shall extend for a time period of ninety (90) days from the date a written request is received by the **DEPARTMENT**. During this ninety (90) day period the **DEPARTMENT** may elect to accept the non-exclusive license for a single up-front payment of ten thousand dollars (\$10,000.00), upon execution of purchase order or other authority to pay.

The term Business Partner means any person or entity with which **DEPARTMENT** has a written agreement with obligations relating to the joint development, distribution or marketing of Licensed Products in a collaborative manner, rather than merely a grant of sublicense under the **UNIVERSITY** intellectual property rights.

B. **UNIVERSITY** shall have the right to make and use the Licensed Product and/or other proprietary processes developed under this CONTRACT for: internal research, use in developing commercial plant material, commercial research, educational purposes, and meeting all applicable governmental requirements.

6. **CONSIDERATION**

A. **Costs, Billings and Other Support**

1) **DEPARTMENT** shall make quarterly payments according to the Budget approved in Appendix A in the amount of One Hundred Six Thousand Nine Hundred Fifteen Dollars (\$106,915.00). The first payment of twenty-five percent (25%) of the total CONTRACT will be due upon execution of the CONTRACT, acceptance by the **DEPARTMENT** of a complete proposal and budget that is fully responsive to the solicitation and reviewers' comments and receipt of invoice. The second and subsequent payments of twenty-five percent (25%) of the total Year One CONTRACT amount will be made after receipt of quarterly reports per Section III.3 and receipt of invoice. There shall be no separate payment for travel.

2) **DEPARTMENT** shall withhold ten percent (10%) of the total **CONTRACT** amount, the amount to be deducted from the fourth payment, until the annual report is received as described in Section III.3.A.

3) The Executive Director has the authority to modify the payment schedule, subject to **UNIVERSITY'S** approval, so long as the payment terms do not exceed the contract term and the total fixed costs.

B. Prior to any payment, **DEPARTMENT** shall require an invoice and quarterly progress report outlining services provided since last payment. The invoices must be submitted thirty (30) days prior to each scheduled payment and must specify sufficient detail for proper pre-audit and post-audit thereof. Payment will include interest if not paid on a timely basis within forty (40) days. Invoices shall be mailed to:

Audrey Nowicki  
Florida Department of Citrus  
1115 E. Memorial Blvd.  
Lakeland, FL 33802-0148  
863-499-2529

C. Should **DEPARTMENT**, in good faith, dispute any invoice or item supplied by **UNIVERSITY**, **DEPARTMENT** shall give timely written notice setting forth the basis for such dispute. Notwithstanding the terms of the **CONTRACT** to the contrary, the disputed invoice or the disputed item within an invoice shall not be payable until after the resolution of such dispute. **DEPARTMENT** shall use best efforts to timely resolve any invoice disputes and shall make payment on those undisputed items in accordance with statutory requirements.

D. **DEPARTMENT** shall have the right to review or inspect any and all records, reports, documents and such other supporting evidence as it reasonably deems necessary to verify compliance with the terms of this **CONTRACT**. Specifically:

1) Upon **DEPARTMENT'S** request, **UNIVERSITY** shall provide such records in hard copy, machine- readable form, or both. **UNIVERSITY** shall maintain such records and allow **DEPARTMENT** to exercise such right to review such records for a period of five (5) years after final payment on this **CONTRACT**, or longer if required by law.

2) **UNIVERSITY** shall use all reasonable efforts to include the "right to review provisions" of this **CONTRACT** in all agreements with sub-contractors and any

other business entities providing goods or services in direct or indirect support of this CONTRACT. Should **DEPARTMENT** exercise this right to review, **UNIVERSITY** shall provide reasonable work space as well as access to photocopy machines and the right to interview current **UNIVERSITY** employees and contact information for former employees.

3) **DEPARTMENT** agrees to provide reasonable notice to **UNIVERSITY** in the event the **DEPARTMENT** intends to exercise its right to such review or inspection.

#### **IV. OTHER PROVISIONS**

##### **1. TERM**

This CONTRACT shall become effective upon complete execution of this CONTRACT and will terminate upon completion of all services which are stipulated in this CONTRACT or no later than twelve months plus thirty (30) days from date of execution. **DEPARTMENT** has the option to renew CONTRACT for each subsequent Project Year as outlined in Appendix A, at existing terms and conditions. Renewal shall be contingent upon **UNIVERSITY'S** satisfactory performance. The term "satisfactory" shall mean in accordance with this CONTRACT and the customary professional standards of the technical field of the principal investigator. Satisfactory performance is not determined by the results of the Project. Nothing herein shall obligate **DEPARTMENT** to exercise its renewal option.

##### **2. LEGISLATIVE APPROPRIATIONS**

**UNIVERSITY** acknowledges that **DEPARTMENT** derives all of its funds from state legislative appropriation and that **DEPARTMENT** obligations under this CONTRACT are, thus, subject to the continued availability of such funds to **DEPARTMENT**.

##### **3. TERMINATION**

Either party has the right to terminate its obligations and liabilities under this CONTRACT upon ninety (90) days prior written notice (hereinafter "Termination Notice") to the other via certified or registered mail. Ninety (90) days prior notice shall be deemed to have begun on the date notice is received via certified or registered notice. Upon receipt of Termination Notice, **UNIVERSITY** shall begin to cease rendering any further services to **DEPARTMENT** in connection with this CONTRACT. **DEPARTMENT** shall not be responsible for the payment of any services performed by **UNIVERSITY** after the termination date. Nothing herein shall relieve **DEPARTMENT** of its obligation to pay for those services performed before receipt of the Termination Notice

Subject to Section III,5 termination of this CONTRACT by either party for any reason, other than failure of **DEPARTMENT** to pay **UNIVERSITY** for Project Budget, shall not affect the rights and obligations of the parties accrued prior to the effective date of termination of this CONTRACT. No termination of this CONTRACT, however effectuated, shall release the parties hereto from their rights and obligations under Sections III, 3, 4, and 5.

4. **DISPUTE RESOLUTION**

Any disputes arising from this CONTRACT shall be resolved in a timely manner by first attempting good faith negotiation, then referring the matter to senior executives of both parties, and then through a mutually agreeable neutral advisor. If any issue is not resolved by meeting with the neutral advisor, either party may file appropriate administrative or judicial proceedings with respect to issues that remain in dispute.

5. **PUBLIC RECORDS**

**UNIVERSITY** acknowledges that pursuant to Chapter 119, Florida Statutes, **DEPARTMENT** has a duty to allow public access to all documents which do not enjoy an exemption, including, but not limited to, invoices, vouchers, payroll information, insurance information and other records created in conjunction with this CONTRACT. Accordingly, **UNIVERSITY** shall make such access available where pertinent documents and materials are in the custody or control of **UNIVERSITY**. The records denial by **UNIVERSITY** of such access shall give **DEPARTMENT** the right to effect immediate termination of CONTRACT. **UNIVERSITY** shall not at any time destroy any such records without prior written approval of **DEPARTMENT**.

6. **CRIMES ENTITY**

**UNIVERSITY** is informed that a person who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity in excess of the threshold amount provided in Section 287.017, Florida Statutes, for Category Two for a period of thirty-six months from the date of being place on the convicted vendor list.

7. **VENDOR OMBUDSMAN**

A Vendor Ombudsman has been established within the Department of Financial Services. The duties of this individual include acting as an advocate for vendors who may be experiencing problems in obtaining timely payment(s) from a state agency. The

Vendor Ombudsman may be contacted at (850) 413-5516. . To facilitate the payment process, **UNIVERSITY** may request electronic transfer of funds (EFT) by logging onto the site below and following directions:

<https://flair.dbf.state.fl.us/dispub/forms1.htm>

8. **REGISTRATION**

**UNIVERSITY** acknowledges that all vendors and contractors doing business with the State of Florida as defined in Section 287.012, Florida Statutes, shall register with MyFloridaMarketPlace, the State e-procurement system, in compliance with Rule 60A-1.030, Florida Administrative Code.

9. **FORCE MAJEURE**

Neither party shall be liable for damages due to any delay or failure to perform its obligations contemplated in this CONTRACT due directly or indirectly to fire, explosion, strike, freight embargo, act of God, or of the public enemy, war, civil disturbance, act of any government, de jure or de facto, or agency or official thereof, labor shortage, transportation contingencies, unusually severe weather, quarantine restrictions, epidemic, catastrophe, or circumstances beyond either party's reasonable control. Any schedule or time for performance required under this CONTRACT shall be extended as necessary to overcome the effects of such force majeure.

10. **ACCURACY**

A. **DEPARTMENT** shall be responsible for the accuracy of information, representations, reports, data, materials, and releases furnished by **DEPARTMENT** for use or release by **UNIVERSITY**.

B. **UNIVERSITY** shall be responsible for the accuracy of information, representations, reports, data, materials, and releases furnished by **UNIVERSITY**.

11. **AGENCY OR JOINT VENTURE**

Nothing in this CONTRACT shall be construed to create any agency relationship between **UNIVERSITY** and **DEPARTMENT**. Neither **UNIVERSITY** nor **DEPARTMENT** shall have any authority to act for or bind the other. Nothing in this CONTRACT shall be construed to create any joint venture or partnership relationship between **UNIVERSITY** and **DEPARTMENT**.

12. **ASSIGNABILITY**

This CONTRACT may be assigned by **DEPARTMENT** hereto without the prior written consent of the other party.

13. **THIRD PARTY BENEFICIARY**

This CONTRACT is made for the sole and exclusive benefit of **UNIVERSITY** and **DEPARTMENT**, and is not intended to benefit any other third party. No other third party may claim any right or benefit or seek to enforce any term or provision of this CONTRACT.

14. **SEVERABILITY OF INVALID PROVISIONS**

Any provision of this CONTRACT which is prohibited or unenforceable in any jurisdiction shall, as to such jurisdiction only, be ineffective only to the extent of such prohibition or unenforceability without invalidating the remaining provisions hereof, and any such prohibition or unenforceability in any jurisdiction shall not invalidate or render unenforceable such provision in any other jurisdiction.

15. **WAIVER**

The failure of either party to insist upon a performance of this CONTRACT, or any of the terms and conditions thereof, shall not be deemed a waiver of any rights or remedies that such party may have and shall not be deemed a waiver of any subsequent breach or default of any such terms or conditions.

16. **WORD CONSTRUCTION**

All references in this CONTRACT to the singular shall be deemed to include the plural when the context so requires, and vice versa. References in the collective or conjunctive shall also include the disjunctive unless the context otherwise clearly requires a different interpretation.

17. **TITLES**

The titles of the several sections, subsections, and paragraphs set forth in this CONTRACT are inserted for convenience of reference only and shall be disregarded in construing or interpreting any of the provisions of this CONTRACT.

18. **NOTICES**

All notices by any party to this CONTRACT shall be in writing via certified mail, return receipt requested. Notices shall be deemed given when received by **UNIVERSITY** or **DEPARTMENT** at the mail addresses stated herein. Any notice otherwise delivered shall be deemed to be given when actually received by the addressee.

Addresses:

Cornell University

Kimberly Hayes, Sr. Grant  
and Contract Officer  
373 Pine Tree Road  
Ithaca, New York 14850

Florida Department of Citrus

Office of General Counsel  
1115 East Memorial Blvd.  
Lakeland, FL 33802-0148

19. **DISCRIMINATION**

An entity or affiliate who has been placed on the discriminatory vendor list may not submit a bid on a contract to provide goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not award or perform work as a contractor, supplier, subcontractor, or consultant under contract with any public entity, and may not transact business with any public entity.

20. **UNAUTHORIZED ALIEN WORKERS**

The State of Florida does not intend to award publicly funded contracts to those who knowingly employ unauthorized alien workers. The **DEPARTMENT** shall consider this a violation of Section 274A(e) of the Immigration and Nationality Act. Such violation shall be cause for unilateral cancellation of this CONTRACT, if **UNIVERSITY** knowingly employs unauthorized aliens.

21. **INDEMNIFICATION**

**UNIVERSITY** assumes any and all risks of personal injury and property damage attributable to the negligent acts or omissions of the **UNIVERSITY** and the officers, employees, and servants thereof while acting in the scope of their employment by **UNIVERSITY**. The **UNIVERSITY** represents that it is self-funding for liability insurance, both public and property, with such protection being applicable to the **UNIVERSITY's** officers, employees, and servants while acting within the scope of their employment by the **UNIVERSITY**. The **UNIVERSITY** and **DEPARTMENT** further agree that nothing contained herein shall be construed or interpreted as 1) denying to either party

any remedy or defense available to such party under the laws of the State of New York;  
2) the consent of the **UNIVERSITY**, the State of New York , or their agencies to be sued.

22. **ATTORNEY FEES**

In the event either party has to take legal action to enforce any terms of this CONTRACT, the prevailing party shall be entitled to reimbursement of all attorneys' fees and cost incurred for such action.

23. **CERTIFICATION OF SIGNING REPRESENTATIVE**

The representative signing this CONTRACT on behalf of **UNIVERSITY** and **DEPARTMENT** each represents that he or she has been duly authorized to execute and deliver this CONTRACT and that upon execution and delivery hereof by all parties hereto, this CONTRACT will be binding and enforceable in accordance with its terms against such party for whom such representative has signed.

24. **ENTIRE AGREEMENT**

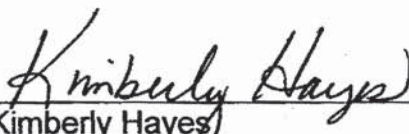
The terms and provisions contained herein constitute the entire agreement between the parties, and no statement or inducement with respect to the subject matter hereof by either party or by any agent or representative of either party which is not contained in this CONTRACT shall be valid or binding as between the parties. In the event that any clause or requirement of this CONTRACT is contradictory to, or conflicts with the requirements of Florida law, including but not limited to requirements regarding contracts with Florida's governmental agencies, the offending clause or requirement shall be without force and effect and the requirement of the Florida Statutes and rules promulgated thereunder on the same subject shall substitute for that clause or requirement and be binding on all parties to this CONTRACT. This CONTRACT may not be amended or modified except by a writing signed by both parties. Both parties agree that this CONTRACT supersedes all prior proposals, representations, understandings and agreements. Furthermore, while CONTRACT was prepared by **DEPARTMENT**, **UNIVERSITY** has had the opportunity to review CONTRACT with its authorized representative and has contributed to the drafting of CONTRACT. Therefore, the CONTRACT shall not be construed against the **DEPARTMENT** as to any ambiguities or points of clarification.

**V. SIGNATURE**

STATE OF FLORIDA,  
DEPARTMENT OF CITRUS

CORNELL UNIVERSITY


By   
Kenneth O. Keck  
Executive Director

By   
Kimberly Hayes  
Sr. Grant and Contract Officer

Date April 1, 2009

Date April 3, 2009

Attest 

Attest 

Florida Citrus Commission

SEAL

SEAL



# Florida Citrus Advanced Technology Program

BUDGET NARRATIVE for FCATP08: Control of Citrus Greening, Canker & Emerging Diseases of Citrus

## TITLE and CONTACT INFORMATION

SUBMIT TO FCPRAC

*Proposal Title*

Management of Psylla in Tree Fruit Crops Using RNA Interference

E-SUBMIT

*Principal Investigator* Kerik D. Cox

*Today's Date* 1-22-09

*Email* kdc33@cornell.edu

*NAS ID Number* 38

*Original Budget Amount* 329,379

*Revised Budget Amount* 329,379

## REVISED BUDGET NARRATIVE (1000 words)

Budget Revision Summary: Reviewer comments were favorable offering only suggestions or requesting clarification of procedures or the project timetable. We felt that we could address all reviewer concerns without needing to raise the budget to use VIGS technology or reduce budget expenditures. We may have underestimated the budget by excluding funding for conformational sequencing and primer purchases. Below our response to review, you will find an exceptionally detailed budget with price estimates and justifications down to the kit.

Response to review: Main concern from reviewer #1: "Although the citrus psyllid and the peach aphid are phloem feeders, targets that inhibit aphid survival may not be transferable to psyllids. Aphids on Arabidopsis thaliana and plum may not have sufficient analogy to psyllids on citrus to ensure the technology developed in this proposal will "crossover"". The reviewer's concern is well placed, but the concern of non-transferrability shouldn't be an issue. Artificial feeding tests are going to be performed on both aphids (Myzus persicae) and psyllids (Diuraphis citri) to identify specific effective targets for each. While progress is made in the field of citrus transformation, we need to validate the idea (complete proof concept) of using RNAi on phloem feeding insects. It makes most sense to start with using a plant/insect model that we can legally test and is easily transformed until citrus is more readily amendable. The bottom line is that D. citri-specific dsRNAi constructs will be made and validated in vivo, but we must first refine the in planta application of RNAi using a familiar related model system before moving to citrus.

Main concern from reviewer #2: "Transformation of Arabidopsis is not the fastest technology for screening dsRNAi constructs in vivo. The authors may want to explore virus-induced gene silencing technology to avoid plant transformation in the early stages of screening dsRNAi targets". In the proposed work we must not only screen for dsRNAi constructs in vivo, but also need to conduct insect feeding evaluations that more closely represent host-insect interactions in the field. While VIGS technology expresses constructs only transiently, the transformation system will allow us to perform the feeding test at any time of the life span of the insect model since the plant is continuously expressing the construct. Due to the expression transiency of VIGS, it becomes more logistically difficult to assess feeding impacts on the proposed insects (D. citri and M. persicae) for an extended period. Moreover, the infrastructure and expertise for the currently proposed methodology is already in place. It may take us longer to perfect a VIGS evaluation system.

Reviewer #3 commented that we failed to provide a clear timetable. We found this surprising because reviewer #1 writes that ' The timetable was clearly stated, with the first two years focusing on the model plants and by year 3 transgenic citrus will be made for evaluation'. Below we have pasted the timetable.

Year 1: Gene cloning from M. persicae and D. citri.- Artificial feeding test on both insects

Year 2: Finishing artificial feeding test - Starting A. thaliana and P. domestica transformation with the most promising gene constructs.

First in vivo feeding test on transgenic A. thaliana.

Year 3: In vivo feeding test on transgenic A. thaliana and plum - Citrus transformation with best gene candidates

### Budget Justification:

Personnel Salary: A total of \$182,423 is requested to cover the full-time salary and fringe benefits for one Postdoctoral Associate and \$84,694 is requested to cover the half-time salary and fringe benefits for one Research Technician III for the duration of the project. Under the guidance of the PIs, these individuals will coordinate and conduct all RNAi work, plant transformation and evaluation, and insect rearing and feeding assays. We also request summer salary and fringe benefits (\$21,162) for one prebaccalaureate student (summer labor) (\$9.50/hr x 40 hrs/wk x 3 months in Year 1; \$9.75/hr in Year 2; and \$10.00/hr in Year 3) for all 3 years. This individual will assist the Technician and Postdoctoral Associate with the insect rearing and transgenic line propagation during the summer months when test insect populations are present. Cornell fringe benefits are requested at the rate of 50.73%.

Materials and Supplies: Funds in the amount of \$22,500 (\$7,500 per year) are requested over the 36-month duration of the project to cover the purchase of miscellaneous materials and supplies needed for the RNAi experiments, plant host transformation and evaluation, and insect rearing and feeding assays. These supplies include laboratory consumables such as culture media, culture amendments, culture plates, lab sanitation materials, and routine molecular biology kits (e.g DNA extraction kits and PCR reagents). In addition, we request a total of \$8,100 in Year 1 to cover the purchase of cloning kits (Topo cloning kit: \$800 each, 3 kits required: \$2,400; Gateway cloning kit: pENTR with LR clonase kit: 40 rxns, \$1,200) and dsRNA generation kits (Ribomax-Promega: \$300 per kit, 15 kits required. \$4,500). We also request \$2,000 for greenhouse growth stands and lighting for regenerating transformed hosts in Year 2.

Travel: Travel funds in the amount of \$4,500 (\$1,500 per year) are requested to cover expense of visits to collect insects (aphids and psylla) from NY stone and pome fruit plantings, and visits with colleagues with psyllid and aphid insect rearing facilities in West Virginia and Oklahoma. These would also cover travel to Florida to present research progress to citrus growers at winter extension meetings. Since these visits would include out of state travel, some visits will require overnight accommodations and possibly air travel. Additional travel funds in the amount of \$4,000 are requested in Year 2 for PI visits to our colleagues in Spain (program of Peña et al.) currently conducting citrus transformation work.



# Florida Citrus Advanced Technology Program

REVISED BUDGET for FCATP08: Control of Citrus Greening, Canker & Emerging Diseases of Citrus

**Budget Instructions** This is a two-page form that is due no later than January 30, 2009. The first page contains the narrative for your proposal and the second page contains revised budget information. Information from this Budget Form will be used for reevaluating your project.

<b>INVESTIGATOR</b>	Kerik D. Cox	<b>TOTAL DIRECT</b> <sup>1</sup>	106,915
<b>PROJECT TITLE</b>	Management of Psylla in Tree Fruit Crops Using RNA Interference		

<b>SALARIES</b>					
	FTEs <sup>2</sup>	AMOUNT <sup>3</sup>	FRINGE <sup>4</sup>	INSURANCE <sup>5</sup>	TOTAL
FACULTY	0	0	0	0	0
POST DOC	1.0	37,027	18,784	0	55,811
STAFF	0.5	18,000	9,131	0	27,131
PART-TIME OPS	0.25	4,560	2,313	0	6,873
<b>SUBTOTAL</b>	<b>1.75</b>	<b>59,587</b>	<b>30,228</b>	<b>0</b>	<b>89,815</b>
<b>TOTAL SALARIES</b>					<b>89,815</b>

**Notes**

<sup>1</sup> **Total Direct** This is the total direct funds you are requesting from the program for the current year (not for the entire duration). This value will be calculated automatically from data entered into the form.

<sup>2</sup> **FTEs** Full-time equivalents.

<sup>3</sup> **Amount** Dollar amount (\$US) of item listed.

<sup>4</sup> **Fringe** Round off vacation, sick days and related fringe expenses.

<sup>5</sup> **Insurance** Health insurance, etc.

<sup>6</sup> **Materials** Materials and supplies required for the project.

<sup>7</sup> **Publications** Page and other costs from publishing this research.

<sup>8</sup> **Consultants** This item includes wages and other costs for each subcontracted institution or firm. Note that the separate **Subcontractor Expense Form** needs to be completed for each subcontracted firm. This form is on the FCPRAC Proposals Page.

<sup>9</sup> **Additional Research Support** Describe matching funds and in-kinds contributions in the space below. This will be competitively evaluated with your other information.

<b>EXPENSES</b>	
<b>MATERIALS</b> <sup>6</sup>	15,600
TRAVEL (domestic)	1,500
TRAVEL (foreign)	0
<b>PUBLICATIONS</b> <sup>7</sup>	0
<b>COMPUTERS</b>	0
<b>CONSULTANTS</b> <sup>8</sup>	0
<b>OTHER DIRECT</b>	0
<b>TOTAL EXPENSES</b>	<b>17,100</b>

<b>EQUIPMENT</b>	0
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<b>TOTAL DIRECT</b> <sup>1</sup>	106,915
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Year 2 Request - Full-time Postdoctoral Associate (\$40,751) + 1/2 time Technician (\$18,720) + Summer Worker (\$4,680)  
 Total Salaries & Wages = \$64,151 + 50.73% Fringe Benefits (\$32,545) = \$96,696  
 Materials = \$9,500 + Travel (\$1,500 Domestic + \$4,000 Foreign) - Total Expenses = \$15,000  
 Total Salaries + Expenses Year 2 = \$111,696

Year 3 Request - Full-time Postdoctoral Associate (\$43,248) + 1/2 time Technician (\$19,469) + Summer Worker (\$4,800)  
 Total Salaries & Wages = \$67,517 + 50.73% Fringe Benefits (\$34,251) = \$101,768  
 Materials = \$7,500 + Travel (\$1,500 Domestic) - Total Expenses = \$9,000  
 Total Salaries + Expenses Year 3 = \$110,768