CTRI ANNUAL RESEARCH: FULL PROPOSAL REQUESTS - FINAL DECISIONS FEBRUARY 18, 2026						
Broomrape Containment, Control and Management		Research Lead	Institution	2025 Funded	2026 Full Proposal Requested	
2019 Start	Broomrape: Development of Long Term Management Options - Ongoing Work	Brad Hanson	UC Davis	$ 128,256	$ 94,335	
2021 Start	Developing Best Equipment Sanitation Practices for Broomrape & Other High-Profile Soil Borne Pathogens; To Mitigate Field-to-Field Spread	Cassandra Swett	UC Davis	$ 84,884	$ 120,532	
2026 Start	Broomrape Outreach: A One-Year Project to Develop Essential Outreach Support for Broomrape Management	UC Strategic Comms	UC Davis	$ -	$ 79,736	
2022 Start	Determining the Population Structure of Phelipanche ramosa Field Detections in California	Adam Schneider	UW - LaCrosse	$ 5,804	$ -	
2022 Start	Developing Tomato Lines Resistant to Branched Broomrape, a Critical California Pest	Neelima Sinha	UC Davis	$ 30,000	$ 98,000	
2022 Start	Inducible Suberin for Tomato Drought Tolerance (Root Architecture)	Siobhan Brady	UC Davis	$ 17,000	No Cost Extension	
2025 Start	Broomrape Resistant, Climate Resilient Tomato Rootstocks for Grafted Processing Tomatoes	Ryan Lefers	iyris	$ 25,000	$ 15,000	
2025 Start	Targeting Strigolactone Receptors in Branched & Egyptian Broomrape	Marco Burger	Salk Institute	$ 49,000	$ 77,023	
2026 Start	Identification of Soil Microbes that Disrupt Broomrape Seed Germination	Johan Leveau	UC Davis	$ -	$ 3,900	
2023 Start	Detection of Broomrape Infestations with Remote Sensing	Alireza Pourreza	UC Davis	$ 40,000	$ -	
2025 Start	Rapid Broomrape Detection Leading to In-Field Options	Chris Laudando	Laudando & Associates	$ 126,500	No Cost Extension	
			TOTALS	$ 506,444	$ 488,526	

Full Proposal Requests – A Note for the Broomrape Board: Below are the broomrape projects funded in 2025 and the projects invited to submit full proposals for funding decisions on February 18, 2026. An invitation to submit does not guarantee 2026 funding. Notes in red in the text below flag updates from previous versions of this document. If every requested full proposal were funded at the amounts asked – which is not anticipated – CTRI and the Broomrape Board would face a total 2026 research cost of $551,776.

Integrated Broomrape Management: Field, Lab, and Extension Strategies – *Brad Hanson*

CTRI's lead broomrape project continues to deliver tools for managing this high-risk pest. 2025 work refined herbicide programs, tested maleic hydrazide and germination stimulants, and studied how flooding and nitrogen affect seed survival. An online calendar for matrix chemigation, scouting, and rogueing has been developed, pending Broomrape Board edits. If field conditions allow, fumigation trials will begin. In addition to the long-standing field site, two additional locations for field research have been identified.

Equipment sanitation for broomrape and soilborne disease prevention – *Cassandra Swett*

Supporting the development of science-based BMPs for cleaning equipment to slow broomrape spread; 2025 work included risk assessments by machine type and timing, piloting of on-board cleaning systems, and sanitizer trials under debris-heavy conditions. This work will continue in 2026. Outreach efforts will continue, but in coordination with the UC Strategic Communications office. This change will bring additional expertise and resources to updated BMPs, grower and processor training tools, and videos to support adoption – getting this information extended in alignment with the needs of the Broomrape Board Compliance Agreements. Full proposal to focus on moving science into extension. CTRI will work with the outreach team to align scope with Broomrape Board needs, and cost share from the CLFP Research Subcommittee has been applied for, both expected to lower costs.

Genetic Tracking of Branched Broomrape Populations – *Adam Schneider*

This work confirmed that CA broomrape infestations trace back to a single introduction decades ago, genetically distinct from Chilean and European populations. Final work in 2025 wrapped up CTRI's investment in understanding Branched broomrape origins; supporting targeted containment efforts. No funding commitment for 2026.

Developing broomrape-resistant tomato lines – *Neelima Sinha*

This project uses advanced genetics to identify tomato genes that block broomrape infection. In 2025, researchers applied single-cell sequencing to refine CRISPR targets. Building on earlier work with hairy root assays and natural

resistance, the goal is to support future breeding of broomrape-resistant varieties without yield loss. In 2026, the team will evaluate mature CRISPR-edited plants, both single- and multi-gene combinations, to identify the most durable resistance responses. They will also continue screening wild tomato accessions to further pinpoint resistant genetic regions and begin developing stable, non-transgenic lines at the UC Davis Plant Transformation Facility to move this work closer to field application.

Using suberin to improve drought and pest resistance in tomato - *Siobhan Brady*
Researchers are evaluating gene-edited and hybrid lines with increased suberin in tomato roots to reduce broomrape susceptibility and improve drought tolerance. This work will continue, at no cost to the industry in 2026. The goal is to identify lines with no yield penalty and enable new breeding strategies for more resilient tomatoes, in collaboration with commercial breeding partners. No funding commitment for 2026.

Testing novel tomato rootstocks for resilience and broomrape resistance – *Iyris*
New rootstocks developed through wild relatives and polyploidy are being evaluated for broomrape resistance and agronomic performance. In 2025, grafted and ungrafted plants were tested in California and Chilean fields with known broomrape pressure. Results from California were inconclusive. This work will continue in 2026 contingent upon Chilean trial results and the continued support of grafting by the CA industry.

Searching for New Chemistries to Stop Broomrape – *Marco Burger*
A 30,000-compound screen is being run to identify chemicals that block broomrape germination or trigger suicidal germination before broomrape reaches tomato roots. 2026 work builds on this with five promising chemical leads already found, including one that completely stopped broomrape germination in UC Davis tests. The next step: refine these compounds for real-world use—testing solubility, irrigation compatibility, and field performance. In addition, this team will run the same experiment with Egyptian broomrape as the target. Cost reduced by $12,085.

Identification of Soil Microbes that Disrupt Broomrape Seed Germination – Johan Leveau
This new exploratory project, if funded, will screen soil microbes from broomrape-infested fields to find bacteria and fungi that interfere with seed germination. The team will isolate microbes that break down seed coats, damage embryos or radicles, degrade strigolactones, or trigger "suicidal" germination without a host. By the end of the first year, the project will produce a ranked catalog of promising microbial candidates that can be taken into greenhouse and field testing. The long-term goal is to develop low-cost, bio-based tools that shrink broomrape seed banks and reduce dependence on synthetic chemistries.

Satellite-Based Broomrape Detection Tool – *Alireza Pourezza*
Following successful (~68% accuracy) double-blinded validation across 50+ fields, CTRI supported a final round of model development using data from known infested sites in California and Israel. A second double-blinded validation was requested prior to commercial rollout. Although this test of an additional 38 fields improved the overall accuracy (~80%) the rate of false positives and false negatives was still high and the inability of the researcher to explain some anomalous results prompted a pause. The aim of this work was to make broomrape monitoring accessible across the industry, at low cost, through remote sensing. If this is a target of the Broomrape Board this team will have to come back with plans for further validation. No funding commitment for 2026.

Hardware-Based Broomrape Detection for In-Field Use – *Laudando & Associates*
With co-funding from the CDFA Broomrape Board this project builds on successful proof-of-concept work to develop a field-ready broomrape detection system that can be mounted on equipment growers already use. The tool identifies infestations spatially during normal field operations, reducing the need for separate scouting efforts. 2025 work focused on refining detection algorithms and field validation to ensure the system was accurate, scalable, and ready for commercial use. 2026 will see this work finalized and ready for commercial launch after early season data collection, targeting just emerging broomrape shoots – a stage that was not able to be captured in 2025. This will be a no-cost extension. A reminder: the CDFA Broomrape Board committed $63,250 to this project, to be paid back to CTRI. This payment is accounted for in the $ amount noted above ($551,776).