

James John Kalani Leary

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Mission

Extend scientific knowledge and technology towards efficient tactics and successful strategies in invasive plant species management

Education

2007	PhD	Molecular Biosciences	University of Hawaii at Manoa, Honolulu, HI
1999	MS	Horticulture	University of Hawaii at Manoa, Honolulu, HI
1996	BS	Horticulture and Chemistry	Michigan State University, East Lansing, MI

Professional Experience

2015-present	Associate Specialist	Natural Resource and Environmental Management, University of Hawaii at Manoa
2009-2015	Assistant Specialist	Natural Resource and Environmental Management, University of Hawaii at Manoa
2007-2009	Assistant Researcher	Natural Resource and Environmental Management, University of Hawaii at Manoa
2001-2007	Graduate Assistant	Molecular Biosciences and Bioengineering, University of Hawaii at Manoa
1999-2001	Research Associate	Tropical Plant and Soil Science, University of Hawaii at Manoa
1997-1999	Graduate Assistant	Tropical Plant and Soil Science, University of Hawaii at Manoa

Refereed Journal Publications

Rodriguez, R., D. Jenkins, J.K. Leary and B.V. Mahnken. 2016. Herbicide Ballistic Technology: Spatial Tracking Analysis of Operations Characterizing Performance of Target Treatment. *Transactions of the ASABE. In press*

Ellsworth, L.M., C.M. Litton, J.K. Leary. 2016. Impact of restoration of a dryland tropical ecosystem dominated by *Megathyrsus maximus* on fuels and future fire potential. *Restoration Ecology. In press*

Friday, J.B., S. Cordell, C. P. Giardina, F. Inman-Narahari, N. Koch, J.K. Leary, C. Litton, C. Trauernicht. 2015. Future directions for forest restoration in Hawai'i. *New Forests* 46: 733-746.

Pinto, J.R., A.S. Davis, M.M. Aghai, J.K. Leary. 2015. Accelerating *Acacia koa* restoration in a Hawaiian montane ecosystem through stocktype selection and grass suppression. *New Forests* 46: 855-867.

Bremer, L., J.M.S. Delevaux, J.K. Leary, L. Cox, K.L.L. Oleson. 2015. An assessment of opportunities to adopt ecosystem services knowledge and decision support tools for terrestrial and marine management in Hawaii. *Environmental Management*. DOI: 10.1007/s00267-014-0426-4.

- Rodriguez, R., D. Jenkins, J.K. Leary. 2015. Design and Validation of a GPS Logger System for Recording Aerial-Deployed Herbicide Ballistic Technology Operations. *IEEE Sensors*. 15: 2078-2086.
- Leary, J.K., B. Mahnken, L. Cox, A. Radford, J. Yanagida, T. Penniman, D. Duffy and J. Gooding. 2014. Reducing Nascent Miconia (*Miconia calvenscens* DC) Patches through Accelerated Interventions Utilizing Herbicide Ballistic Technology (HBT). *Inv. Plant Sci. Mgmt.* 7 (1) 164-175. DOI: 10.1614/IPSM-D-13-00059.1 **Awarded 2015 Outstanding Paper for IPSM**
- Leary, J.K., J. Gooding, J. Chapman, B. Mahnkan, A. Radford, L. Cox, 2013. Calibration of an Herbicide Ballistic Technology (HBT) Helicopter Platform Targeting Miconia (*Miconia calvenscens* DC) in Hawaii. *Inv. Plant Sci. Mgmt.* 6(2) 292-303. DOI: 10.1614/IPSM-D-12-00026.1 (with press release; see popular media)
- Ammond, S. A., C.M. Litton, L.M. Ellsworth and J.K. Leary. 2012. Restoration of native plant communities in a Hawaiian dry lowland ecosystem dominated by the invasive grass *Megathyrsus maximus*. *Appl. Veg. Sci.* 16(1): 29-39. DOI: 10.1111/j.1654-109X.2012.01208.x
- Leary, J.K., J. DeFrank, and B. Sipes. (2006) Tropical eggplant (*Solanum melongena* L.) production with a buffelgrass (*Pennisetum ciliare* L.) living mulch system in Hawaii. *Biol. Ag. Hort.* 24: 105-116.
- Leary, J.K., P.W. Singleton, P. Scowcroft, and D. Borthakur. (2006) Symbiotic diversity of the cosmopolitan genus *Acacia*. *Symbiosis*. 41: 107-117 (with cover photo).
- Leary, J.K., N.V. Hue, P.W. Singleton, D. Borthakur. (2005) Soil acidification, nutrient depletion, and symbiotic nitrogen fixation are the major features of gorse (*Ulex europaeus*) infestation on volcanic soils in Hawaii. *Biol. Fert. Soils*. 42: 215-223.
- Leary, J.K., P.W. Singleton, D. Borthakur. (2004) Canopy nodulation of the endemic tree legume *Acacia koa* in the mesic forests of Hawaii. *Ecology* 85: 3151-3157.
- Leary, J.K. and J. DeFrank. (2000) Living mulches for organic farming systems. *HortTechnology* 10: 7-13.

Manuscripts in preparation

- Rodriguez, R., J. K. Leary, K. Nolan, B. Mahnken, D. Jenkins. 2016 Performance Analysis of Consumer Grade GPS Units for Dynamic Aerial Applications
- Marshall, J., J. K. Leary, T. Miura. 2016. Invasive Pine Detection and Mapping Using Satellite Remote Sensing at Haleakalā National Park, Maui, Hawai'i
- Leary, Beachy and Enloe. 2017. IPA Efficacy across a Broad Spectrum of Tropical Woody Species

Proceedings, Technical and Extension Publications

- Leary, J.K., J. Beachy J. Lee, A. Hardman, C. Arnott, M. Ikagawa, L.. Poole and S. Kaye. 2015. Basic Calibrations of Basal Bark Applications With Ester-Based Triclopyr in Oil Carrier. *Extension Bulletin WC-12*. University of Hawaii at Manoa. 8 pp. <http://www.ctahr.hawaii.edu/oc/freepubs/pdf/WC-12.pdf>
- Rodriguez, R., D. Jenkins, J.K. Leary and B.V. Mahnken. 2015. Herbicide Ballistic Technology: Spatial Tracking Analysis of Operations Characterizing Performance of Target Treatment. ASABE Paper No. 2190119. New Orleans, LA. doi: xxx

- Leary, J.K., J.B. Friday, S. Kaye and F. Hughes. 2014. Proper Technique for Injecting Albizia (*Falcataria moluccana* L.) with the herbicide Milestone® (active ingredient: Aminopyralid). <http://www.ctahr.hawaii.edu/oc/freepubs/pdf/Albizia%20tri-fold.pdf>
- James R. Hollyer, J.R., D.G. Meyer, F.E. Brooks, R.S. Shimabuku, L.F. Castro, C.Y. Nagamine, C.M. Tarutani, J.S. Sugano, J.K. Leary, L. Nakamura-Tengan and Hawai'i Department of Agriculture Pesticides Branch. 2014. Good Agricultural Practices: A Best Practices Kit for Safe, Legal, and Effective Pesticide Application in Hawai'i. Extension Bulletin FST-59. University of Hawaii at Manoa. 12 pp. <http://www.ctahr.hawaii.edu/oc/freepubs/pdf/FST-59.pdf>
- Rodriguez, R., D. Jenkins, J.K. Leary and B.V. Mahnken. 2014. A Custom GPS Recording System for Improving Operational Performance of Aerially-Deployed Herbicide Ballistic Technology. ASABE Paper No. 141899605. Montreal, Quebec Canada. doi: 10.13031/aim.20141899605
- Rodriguez, R., D. Jenkins, and J.K. Leary. 2014. Integrated Global Positioning System Logging System for Electro-Pneumatic Delivery Applications. Patent pending US 61/991390
- Leary, J.K., J. Beachy and A. Hardman. 2013. A Practitioner's Guide for Testing Herbicide Efficacy with the Incision Point Application (IPA) Technique on Invasive Woody Plant Species. Extension Bulletin WC-11. University of Hawaii at Manoa. 8 pp. <http://www.ctahr.hawaii.edu/oc/freepubs/pdf/WC-11.pdf>
- Leary, J.K. and J. Gross. 2013. Characterizing weed management activities for archeological site preservation and grass-fire mitigation at Kaloko-Honokohau National Historical Park. Technical Report No. 184. Pacific Cooperative Studies Unit, University of Hawai'i, Honolulu, Hawai'i. 35 pp. <http://manoa.hawaii.edu/hpicesu/techr/184/v184.pdf>
- Duncan, C. (editor) and J.K. Leary. 2013. Protecting Paradise Through Partnerships—Surveillance, Detection, and a New Application Technology Benefit Miconia Control Effort. <http://techlinenews.com/articles/2013/3/13/protecting-paradise-through-partnerships>
- Leary, J.K. and C. Duncan (editor). 2013. Herbicide Incision Point Injection for Woody Plant Control Saves Time and Resources. <http://techlinenews.com/articles/2013/3/13/herbicide-incision-point-injection-for-woody-plant-control-saves-time-and-resources>
- Leary, J.K., J. Beachy and A. Hardman. 2012. Practitioner's Guide for Effective Non-Restricted Herbicide Techniques to Control and Suppress Invasive Woody Species in Hawaii. Extension Bulletin WC-10. University of Hawaii at Manoa. p. 8. <http://www.ctahr.hawaii.edu/oc/freepubs/pdf/WC-10.pdf>
- Anonymous. 2012. RCUH Standard Operating Procedure- Herbicide Ballistic Technology Operations: Ground and Aerial Herbicide Application Approved and adopted by the Pacific Cooperative Studies Unit, University of Hawaii. <http://manoa.hawaii.edu/hpicesu/SAFETY/SOP-31.pdf>
- Anonymous. FIFRA sec. 24(c). Special Local Needs Registration. 2012. Milestone® For Control of Albizia (*Falcataria moluccana*) and Other Woody Species in Natural Areas. EPA SLN No. HI-120003. Expiration 2017. http://www2.hawaii.gov/hdoa/labels/sln/1203_2017.pdf

Anonymous. FIFRA sec. 24(c). Special Local Needs Registration. 2012. HBT-G4U200 with Garlon® 4 Ultra. EPA SLN No. HI-120001. Expiration 2017. http://www2.hawaii.gov//hdoa/labels/sln/1201_2017.pdf

Anonymous. FIFRA sec. 24(c). Special Local Needs Registration. 2009. HBT-IMAZ. EPA SLN No. HI-090004. Expiration 2014. http://www2.hawaii.gov//hdoa/labels/sln/0904_2014.pdf

Invited Conference Presentations

Leary, J.K. October 2013. Implementing HBT Technology to Eradicate Invasive Species. Hawaii Water Works Association Annual Conference. Makena Beach, Maui, HI

Leary, J.K. March 2011. Novel Herbicide Application Techniques in Hawaii. Inland Empire Reforestation Council symposium. Coeur d'Alene, ID.

Leary, J.K. February 2010. Improving the efficiency of an invasive weed management strategy: Making decisions, Creating flexibility and Refining techniques. The Nahelehele Dry Forest Symposium. Kailua-Kona, HI

Leary, J.K. January 2010. Developments in Herbicide Ballistic Technology. National Railroad Contractors Association Annual Meeting. Indianapolis, IN

Leary, J.K. November 2009. Updates on Tropical Weed Management. Invasive Weed Summit sponsored by Dow Agrosiences LLC. San Diego, CA

Leary, J.K. October 2009. Developments in Herbicide Ballistic Technology. Oregon Vegetation Management Association Annual Meeting. Seaside, OR

Leary, J.K. October 2009. Developments in Herbicide Ballistic Technology. Oregon Society of Weed Science Annual Symposium. Deschutes, OR

Leary, J.K. July 2009. Developments in Herbicide Ballistic Technology. UH Technology Showcase. Honolulu, HI

Leary, J.K. May 2009. Developments in Herbicide Ballistic Technology. Florida Exotic Plant Pest Council Symposium. Del Ray Beach, FL

Refereed Conference Presentations and Posters

Rodriguez, R., D. Jenkins, J.K. Leary and B.V. Mahnken. March 2016. An Integrated Telemetry System for Herbicide Ballistic Technology (HBT-TS) to Determine Dose to Target and Area Use Rate. Western Society of Weed Science Annual Meeting.

Leary, J.K. September 2015. Quantifying Outcomes Containing *Miconia calvescens* DC in the East Maui Watershed through the Adoption of Herbicide Ballistic Technology. 13th International Conference on the Ecology and Management Alien Plant Invasions. Kona, HI

Beachy, J. J. Lee and J.K. Leary. September 2015. Improving Control of Tropical Invasive Trees Via Undiluted Herbicide Injections. 13th International Conference on the Ecology and Management Alien Plant Invasions. Kona, HI

Hughes, F.R., S. Kaye, R. Ruderman and J.K. Leary August 2015. Using Science-Based Ecological Knowledge to Combat *Albizia (Falcataria moluccana)*: How about a Dose of Forest Management? 23rd Annual Hawai'i Conservation Conference. Hilo, HI

Baribault, T., J.B. Friday, F. Inman-Narahari, J Leary, W. Lee, S. Mann, M. Robinson. 2015. Achieving Conservation Objectives with Commercial Forestry Projects. 23rd Annual Hawai'i Conservation Conference. Hilo, HI

- Leary, J.K. March 2015. Quantifying Outcomes of a FIFRA 24c SLN Herbicide through the Adoption of Herbicide Ballistic Technology. Western Society of Weed Science Annual Meeting. Portland, OR.
- Leary, J.K., J. Beachy and J. Lee. March 2015. Efficacy of Undiluted Herbicide Injections on Tropical Woody Species in Hawaii. Western Society of Weed Science Annual Meeting. Portland, OR
- Rodriguez, R., D. Jenkins, J.K. Leary and B.V. Mahnken. July 2015. Herbicide Ballistic Technology: Spatial Tracking Analysis of Operations Characterizing Performance of Target Treatment. American Society of Agricultural and Biological Engineers Annual International Meeting. New Orleans, LA.
- Davis, A., J.K. Leary, J. Pinto. 2014. Effective site preparation accelerates Acacia koa canopy closure. IUFRO-sponsored 2nd Restoring Forests Conference. Lafayette, IN.
- Rodriguez, R., D. Jenkins, J.K. Leary and B.V. Mahnken. September 2014. A Custom GPS Recording System for Improving Operational Performance of Aerially-Deployed Herbicide Ballistic Technology. Meeting the Challenge: Preventing, Detecting, and Controlling Invasive Plants. University of Washington Botanic Gardens, Seattle, WA. Seattle, WA
- Rodriguez, R., D. Jenkins, J.K. Leary and B.V. Mahnken. July 2014. A Custom GPS Recording System for Improving Operational Performance of Aerially-Deployed Herbicide Ballistic Technology. American Society of Agricultural and Biological Engineers Annual International Meeting. Montreal, QC
- Hughes, F., S. Kaye and J. Leary. Controlling the Albizia Monster in Hawaii's Forested, Agricultural, and (Sub)Urban Landscapes: The What, Where, When, How and Why of Current Efforts. July, 2014. 22nd Annual Hawaii Conservation Conference. Honolulu, HI
- Leary, J.K., B. V. Mahnken, J. Gooding, A. Radford, T. Penniman, L. Cox, D. Duffy. March 2014. Reducing the Nascent Patch Network of Miconia (*Miconia calvescens* DC) with an Accelerated Intervention Strategy Utilizing Herbicide Ballistic Technology (HBT). Western Society of Weed Science Annual Meeting. Colorado Springs, CO.
- Leary, J.K., J. Gooding, J. Chapman, B.V. Mahnkan and A. Radford. Oct. 2012. Operational Performance of a Herbicide Ballistic Technology (HBT) helicopter platform targeting incipient populations of Miconia (*Miconia calvescens*) in Hawaiian Watersheds. California Invasive Plant Council Annual Symposium. Rohnert Park, CA
- Leary, J.K., J. Gooding, J. Chapman, B.V. Mahnkan and A. Radford. Aug. 2012. Identifying an operational niche for an experimental platform: A case study of Herbicide Ballistic Technology. 20th Annual Hawaii Conservation Conference. Honolulu, HI
- Leary, J.K., J. Gooding, J. Chapman, B.V. Mahnkan and A. Radford. Feb. 2012. Calibrating the Herbicide Ballistic Technology (HBT) Helicopter Platform for Targeting Incipient Miconia (*Miconia calvescens*) Populations in Remote Watersheds of Hawaii. 52nd Annual Meeting of the Weed Science Society of America. Waikoloa, HI
- Leary, J.K., J. Pinto, A. Davis, M. Robinson. Nov 2011. Site Preparation in Abandoned Montane Rangelands of Hawaii. Society of American Foresters 91st National Convention. Honolulu, HI.
- Leary, J.K. March 2011. Operational efficiencies of Herbicide Ballistic Technology (a.i. triclopyr) Targeting *Miconia calvecsens*. Western Society of Weed Science Annual Meeting. Spokane, WA

- Leary, J.K., J. Pinto and A. Davis. March 2011. Characterizing site conditions resulting from suppressive applications of glyphosate and imazapyr to abandoned montane rangelands for reforestation in Hawaii. Western Society of Weed Science Annual Meeting. Spokane, WA (poster)
- Leary, J.K. March 2011. Developing Metered Herbicide Incision Techniques to Control Invasive Arboreal and Shrub Targets in the Pacific Basin. Western Society of Weed Science Annual Meeting. Spokane, WA (poster)
- Leary, J.K. and J. Baker. March 2011. Extend invasive weed management with novel technologies and collaborative applied research networks. Western Society of Weed Science Annual Symposium. Spokane, WA
- Leary, J.K. March 2010. The Ecology, Impacts and Management of Perennial Grass Invasions. Symposium Chair/Moderator. Western Society of Weed Science Annual Symposium. Waiakaloa, HI
- Leary, J.K. Oct 2009. Developments in Herbicide Ballistic Technology. California Invasive Plant Council. Visalia, CA
- Leary, J.K., Loeffler K., Cho A., DeFrank J., Bresell M. and Litton C. 2008. The residual activities of imazapyr and glyphosate on dormant *Pennisetum setaceum* (Forssk.) Chiov. (fountain grass). Hawaii Conservation Conference. Honolulu, HI
- Leary, J.K., DeFrank, J. and C. Litton, C. 2008. The residual activities of imazapyr and glyphosate on dormant *Pennisetum setaceum* (Forssk.) Chiov. (fountain grass), under arid conditions within a tropical high-elevation landscape in Hawaii 5th International Weed Science Society Congress. Vancouver BC
- Leary, J.K., Scowcroft P., DeFrank J. and Borthakur, D. 2007. Influences of herbicide/fertilizer combinations as repeated applications to control invasive stoloniferous kikuyu grass (*Pennisetum clandestinum*) in abandoned pastures in Hawaii. 47th Annual Meeting of the Weed Science Society of America. San Antonio, TX. (poster)
- Leary, J.K., D. A. Peltzer, N.V. Hue and D. Borthakur. (poster) 2007. Gorse (*Ulex europaeus*) infestations in Hawaii and New Zealand display similar patterns of resource exploitation from altered landscapes. 47th Annual Weed Science Society of America Meeting. San Antonio, TX
- Leary, J.K. 2005. Major adaptive features of gorse (*Ulex europaeus*) infestation on volcanic soils in Hawaii. 13th Annual Hawaii Conservation Conference. Honolulu, HI
- Leary, J.K. 2005. Major adaptive features of gorse (*Ulex europaeus*) infestation on volcanic soils in Hawaii. CTAHR Student Research Symposium. Best Ph.D. Oral Presentation.
- Leary, J.K., P. Singleton and D. Borthakur. 2004. Canopy nodulation of the endemic tree legume *Acacia koa* in the mesic forests of Hawaii. 19th North American Conference on Symbiotic Nitrogen Fixation. Bozeman, MT
- Leary, J.K., N. V. Hue, P. Singleton and D. Borthakur. 2004. Soil acidification, aluminum exclusion, and symbiotic nitrogen fixation: The major features of gorse (*Ulex europaeus*) infestation on young volcanic soils in Humuula, Hawaii. 19th North American Conference on Symbiotic Nitrogen Fixation. Bozeman, MT (poster)
- Leary, J.K. and DeFrank, J. 2004. Eggplant (*Solanum melongena* L.) yield comparisons of managed buffelgrass (*Pennisetum ciliaris* L.) living mulch systems to a conventional

- monoculture bareground system in Hawaii. 101st Meeting of the American Society for Horticultural Science. Austin, TX.
- DeFrank, J. and J.K. Leary. 2004. The response of potted orchids to sequential postemergence herbicide applications in Hawaii. 101st Meeting of the American Society for Horticultural Science. Austin, TX.
- DeFrank, J. and J.K. Leary. 2004. The response of four anthirium (*Anthirium andraeanum*) cultivars to five sequential applications of four preemergence herbicides in Hawaii. 101st Meeting of the American Society for Horticultural Science. Austin, TX. (poster)
- Leary, J.K. and D. Borthakur. 2003. C Gray. 4th International Symbiosis Congress. Halifax, NS (*Highlighted in Science 301 pg.1467*).
- Leary, J.K. and D. Borthakur. 2003. Adventitious Nodulation of the Endemic Tree Legume, *Acacia koa* Gray. American Society of Plant Biology. Honolulu, HI. (poster)
- Leary, J.K. and D. Borthakur. 2003. Adventitious Nodulation of the Endemic Tree Legume, *Acacia koa* Gray. Hawaii Conservation Conference. Honolulu, HI.
- Leary, J.K. 2003. Adventitious Nodulation of the Endemic Tree Legume, *Acacia koa* Gray. CTAHR Student Research Symposium. Best Ph.D. Oral Presentation.
- Leary, J.K. and J. DeFrank. 2001. Living mulches for organic farming systems. Building Bridges with Traditional Knowledge II. Honolulu, HI
- Leary, J.K. 1999. Tropical eggplant (*Solanum melongena*) production in a buffelgrass (*Pennisetum cilliaris*) living mulch systems. Tester Memorial Symposium. Honolulu, HI. (*Award for Best Presentation*)
- Leary, J.K. 1999. Tropical eggplant (*Solanum melongena*) production in buffelgrass (*Pennisetum cilliaris*) living mulch systems. CTAHR Student Research Symposium. Honolulu, HI. (*Award of Merit for Oral Presentation*)

Grants and Awards

Award year	Funding agency (Project title)	Amount (\$USD)
2016	Supplemental Hatch and Smith Lever Building Capacity for Unmanned Aerial System Programs in CTAHR (pending)	\$39,908
2016	USDA-NIFA Alaska Native-Serving and Native Hawaiian- Serving Institutions Education Competitive Grants Program (ANNH) Piloting A Leadership-Enhanced Degree Program And Distance Delivery For Underserved And Indigenous Populations In Hawaii (pending)	\$450,000
2016	Hawaii Invasive Species Council Science and Technology Based Management of Incipient Miconia (<i>Miconia calyescens</i> DC) Utilizing Herbicide Ballistic Technology (HBT)	\$117,212
2016	Supplemental Hatch and Smith Lever Phase II Development of Herbicide Ballistic Technology-Telemetry Recording System (HBT-TRS)	\$39,952
2015	Department of Hawaiian Home Lands Gorse Control Project	\$2,875

2014	Hawaii Invasive Species Council Quantifying outcomes of miconia (<i>Miconia calvescens</i> DC) management projects through advancements in Herbicide Ballistic Technology (HBT)	\$65,000
2014	Department of Hawaiian Home Lands Gorse Control Project	\$8,280
2014	USDA-CSREES Renewable Resources Extension Act Invasive Species Control Project	\$8,000
2013	USDA-CSREES Renewable Resources Extension Act Invasive Species Control Project	\$10,000
2013	Department of Hawaiian Home Lands Gorse Control Project	\$12,000
2013	Hawaii Invasive Species Council Targeting High-Priority Miconia Patch Populations with an Accelerated Intervention Schedule Utilizing Herbicide Ballistic Technology (HBT).	\$87,000
2013	Pacific Cooperative Studies Unit Adopting New Invasive Weed Management Technologies for the Oahu Army Natural Resource Program (OANRP)	\$68,400
2013	Maui County Office of Economic Development Grants Program A Preemptive Strategy to Facilitate a Fireweed Biological Control Release Program in Maui County	\$20,000
2012	Pacific Cooperative Studies Unit Adopting New Invasive Weed Management Technologies for the Oahu Army Natural Resource Program (OANRP)	\$31,450
2012	US Forest Service Special Technology Development Program Calibrating Herbicide Ballistic Technology (HBT) for Miconia (<i>Miconia calvescens</i>) Target Reduction Operations	\$51,000
2012	Maui County Office of Economic Development Grants Program Fireweed Management Prescription Program	\$90,000
2011	Department of Hawaiian Home Lands Gorse Control Project	\$8,487
2011	Maui County Office of Economic Development Grants Program Fireweed Management Prescription Program	\$90,000
2011	Maui County Office of Economic Development Grants Program Utilizing Herbicide Ballistic Technology (HBT) for aerial eradication of incipient pampas grass (<i>Cortaderia jubata</i>) in the West Maui watershed	\$5,676
2010	USDA-CSREES Renewable Resources Extension Act Ecological management data characterizing <i>Rauvolfia vomitoria</i> infestations in North Kohala	\$5,000
2010	USDA-CSREES Renewable Resources Extension Act Developing safe and efficient herbicide application techniques for the Maui County Fireweed (<i>Senecio madagascariensis</i>) Management Prescription Program	\$5,000
2010	USDA-CSREES Renewable Resources Extension Act	\$10,000

	Promoting new options for koa (<i>Acacia koa</i>) establishment with a selective low-input technique in managing grass competition	
2009	Hawaii Invasive Species Council Developments in Herbicide Ballistic Technology	\$23,805
2009	USDA-NRCS Conservation Innovation Grant Invasive weed management strategies with Herbicide Ballistic Technology	\$76,879
2009	National Park Service Development of efficient vegetation management techniques within Kaloko-Honokohau National Historical Park for cultural resource utilization and endemic plant restoration	\$359,700
2008	The Nature Conservancy Developing Herbicide Ballistic Technology (HBT) for accurate long-range delivery of encapsulated ULV (ultra-low volume) herbicide projectiles to control satellite populations of Australian Tree Fern (<i>Sphaeropteris cooperi</i>) in the native watersheds of Kauai	\$30,934
2008	BASF Corp. Research and demonstration for suppressing fountain grass (<i>Pennisetum setaceum</i>) as a restoration tool at Pu'u Wa'awa'a	\$4000
2008	The Department of Hawaiian Home Lands Rapid Response Mitigation and Monitoring of Incipient Post-Fire Weed Invasions Surrounding the Kanakaleonui Bird Corridor in Humuula	\$14,000
2008	USDA Western Region Sustainable Agriculture Research and Education Professional Development Program Promoting adaptive management with 'Tropic Sun' sunn hemp (<i>Crotalaria juncea</i>) in Hawaii for ecological strategies in weed control, nematode suppression and nutrient management	\$53,804
2008	Hawaii Department of Agriculture Agricultural Research Program The evaluation of native Hawaiian plants as new cover crop selections in local organic vegetable production	\$38,856
2008	USDA-CSREES Renewable Resources Extension Act Promoting new options for koa (<i>Acacia koa</i>) establishment with a selective low-input technique in managing grass competition	\$10,200
2007	The Nature Conservancy Directed ULV (ultra-low volume) herbicide applications for controlling Australian Tree Fern (<i>Sphaeropteris cooperi</i>) in native watersheds on the island of Kauai	\$9,022
2007	USDA-NRCS Conservation Innovation Grant New innovations in native forest restoration for high-elevation rangelands infested with the noxious weed kikuyu grass (<i>Pennisetum clandestinum</i>)	\$92,203
Total grant awards 2007-2014		\$1,463,695

Teaching, Guest Lectures and Seminars

- Apr 2016. Invasive Plant Species Management. Guest lecturer for NREM 301, University of Hawaii at Manoa. Honolulu, HI
- May 2015. Invasive Plant Species Management. Guest lecturer for NREM 301, University of Hawaii at Manoa. Honolulu, HI
- May 2014. Invasive Plant Species Management. Guest lecturer for NREM 301, University of Hawaii at Manoa. Honolulu, HI
- April 2014. Implementing Herbicide Ballistic Technology (HBT) to Surgically Eliminate Invasive Miconia from the East Maui Watershed. Michigan State University. East Lansing, MI
- Nov 2013. Invasive Plant Species Management. Guest lecturer for PEPS 481, University of Hawaii at Manoa. Honolulu, HI
- May 2013. Invasive Plant Species Management. Guest lecturer for NREM 301, University of Hawaii at Manoa. Honolulu, HI
- Mar 2013. Invasive Plant Species Management. Guest lecturer for NREM 605, University of Hawaii at Manoa. Honolulu, HI
- Mar 2012. Invasive Plant Species Management. Guest lecturer for NREM 301, University of Hawaii at Manoa. Honolulu, HI
- Nov 2011. Invasive Plant Species Management. Guest lecturer for NREM 600, University of Hawaii at Manoa. Honolulu, HI
- Nov 2011. Invasive Plant Species Management. Guest lecturer for PEPS 481, University of Hawaii at Manoa. Honolulu, HI
- Mar 2011. Invasive Plant Species Management. Guest lecturer for NREM 301, University of Hawaii at Manoa. Honolulu, HI
- Dec 2010. Field Innovations in Natural Area Weed Management. Guest Lecture for Biology 103, University of Hawaii Maui College, Kahului, HI
- Mar 2010. Weed Management. Guest lecture for NREM 301, University of Hawaii at Manoa, Honolulu, HI
- Jan 2010. Technologies in Tropical Invasive Weed Management and Extension. Guest lecture for the Department of Forestry and Natural Resources, Purdue University West Lafayette, IN
- Jan 2010. Progressive Techniques in Tropical Invasive Weed Management. Invited Seminar. Dow Agrosiences LLC World Headquarters Indianapolis, IN
- May 2009. Developments in Herbicide Ballistic Technology. Guest seminar for the Agronomy Department, University of Florida. Gainesville, FL
- Apr 2009. Weed Management. Guest lecture for NREM 301, University of Hawaii at Manoa, Honolulu, HI
- Feb 2009. Procedures in Terrasurgical Weedectomies- "This won't hurt a bit". Invited seminar of the Institute of Pacific Island Forestry Seminar. Hilo, HI
- Fall 2007. (Instructor) PEPS 481 Weed science. 3 credits

Service on graduate student committees

- Rodriguez, R. PhD. Adaptaion of Herbicide Ballistic Technology (HBT) to Unmanned Aerial Systems (UAS). Dept. of MBBE. Expected graduation 2019.

Waisen, P. PhD. Oil radish (*Raphanus sativus*) as a trap-crop biofumigant against root-knot nematode (*Meloidogyne javanica*). Dept. of PEPS. Expected graduation 2019.

Rodriguez, R. MS. Acoustic Range Finder for use with Herbicide Ballistic Technology Data Logger. Dept. of MBBE. Graduated 2015.

Marshal, J. MS. Plan B non-thesis. Dept. of NREM. Graduated 2016.

Dowling, L. MS. Plan B non-thesis. Dept. of NREM. Graduated 2015.

Lukas, S. PhD. Characterizing seed production of native ground covers. Dept. of TPSS. Graduated 2015.

Diarra, G. PhD. Optimizing koa seedling performance in abandoned pastures. Dept. of NREM. Graduated 2013.

Ellsworth, L. PhD. Predicting and Managing Fire on Oahu's Guinea Grasslands. Dept. of NREM. Graduated 2012.

Ammond, S. MS. Restoration of an invasive grass-dominated ecosystem. Dept. of NREM. Graduated 2011

Lukas, S. MS. Evaluation of a hydromulched, pre-emergent herbicide. Dept. of TPSS. Graduated 2011.

Demonstrations, Workshops and Field Days

Feb-Jul 2016. The Natural Resource and Environmental Management Seminar Series

Feb 2016. Natural Area Weed Workshop III: "Weed Management Challenges in Native Plant Restoration". Waimea Valley, Haliewa, Oahu. Participants: 67

Oct 2015. Maui Nui Natural Areas Weed Management Forum. Participants: 58

Feb 2015. Natural Area Weed Workshop II: "Weed Management Challenges in Native Plant Restoration". Waimea Valley, Haliewa, Oahu. Participants: >50

Dec 2013. Natural-Area Weed Control Workshop, Waimea Valley, Haliewa, Oahu. Participants: >30.

Oct 2013. HBT Demonstration for State Policy Makers: attended by David Ige, State Senator; Russell Ruderman, State Senator; Kalani English, State Senator (Hawaii Senate Ways and Means Committee). Hana, Maui. Participants: 6

Aug 2013. HBT Demonstration for Agricultural Leadership Program Class XIV, Agricultural Leadership Foundation of Hawaii. Piiholo, Maui. Participants: 15

Jun 2013. HBT Demonstration for Federal Policy Makers. Piiholo, Maui. Attended by Dr. Chris Dionigi, Deputy Director of the National Invasive Species Council

Apr 2013. HBT Demonstration for State Policy Makers. Piiholo, Maui. Attended by Mike Gabbard, State Senator

Mar 2013. HBT Demonstration for State Policy Makers. Piiholo, Maui. Attended by Dr. Joe DiTomaso Specialist at UC Davis and President of the Weed Science Society of America

Oct 2012. HBT Demonstration for Regional Collaborators. Santa Cruz Island, CA. Attended by: Dr. Guy Keyser UC Davis and the Los Angeles Conservation Corp. Participants: 4.

May 2012. HBT Demonstration for State Policy Makers. Piiholo, Maui. attended by Russell Kokubun Chair Department of Agriculture; William Aila, Chair Department of Land and Natural Resources; Gary Gill, Chair Department of Health; Clarence Nishihara, State Senator; Kalani English, State Senator. Hawaii Invasive Species Council. Participants: >20.

May 2012. HBT Demonstration for County Policy Makers. Hana, HI. Attended by Pam Pogue Maui County Department of Water Supply

Oct 2012. HBT applicator certification workshop for Maui Invasive Species Committee. Piiholo, Maui. Participants: 3

Oct 2012. HBT applicator certification workshop for Kauai Invasive Species Committee. Waimea, Kauai. Participants: 6

Aug 2012. Piihonua Albizia Control and Technology Transfer Service Project. Hilo, Hawaii. Participants: >10

Jul 2012. HBT applicator certification workshop for West Maui Mountain Watershed Partnership. Kahului, Maui. Participants: 3

May 2012. Demonstration of the Herbicide Ballistic Technology platform to the Hawaii Invasive Species Council. Piiholo, Maui. Participants: >20

May 2012. Demonstration of the Herbicide Ballistic Technology platform to the Director of the Maui Invasive Species Committee and the Assistant Director of the Maui County Department of Water Supply. Hana, Maui. Participants: 2

Feb 2012. Piihonua Albizia Control and Technology Transfer Service Project. Hilo, Hawaii. Participants: >10

Aug 2011. Piihonua Albizia Control and Technology Transfer Service Project. Hilo, Hawaii. Participants: >10

Jul 2011. Herbicide Ballistic Technology Field day with Fremont County Weed and Pest Management District, Wyoming (invited). Riverton, WY. Participants: >20

Jun 2011. Piihonua Albizia Control and Technology Transfer Service Project. Hilo, Hawaii. Participants: >10

May 2011. Piihonua Albizia Control and Technology Transfer Service Project. Hilo, Hawaii. Participants: >10

Nov 2010. Proving concept of Herbicide Ballistic Technology™. Invitation-only participation by the Maui Invasive Species Committee, National Park Service, Oahu Natural Resources Program, UH Office of Technology Transfer, the Hawaii Department of Agriculture Pesticide Branch, Nelson Paint Company and the Wilbur Ellis Company. Hana, Maui. Participants: 11

Oct 2010. Field techniques with Herbicide Ballistic Technology™. Sponsored by the California Invasive Plant Council Santa Cruz Island, CA. Participants: >20

Jun 2010. Improving the efficiency of an invasive weed management strategy: Making Decisions, Creating Flexibility and Refining Techniques. Workshop contribution to the Western SARE Integrated Crop and Livestock Management Workshop. Hilo, HI. Participants: >30

Jun 2010. Integrated Weed Management. Workshop contribution to the Agriculture Internship Training Program sponsored by the Maui County Cooperative Extension Service. Kahului, HI. Participants: 10

Jun 2010. Principles in Weed management. Workshop contribution to the Maui Master Gardener's program. Kahului, HI. Participants: >20

Mar 2010. Gorse infestations of Mauna Kea. Field day contribution sponsored in part by the Western Society of Weed Science. Waikoloa, HI. Participants: >40

- Mar 2010. Kickin' some grass: herbicides that work in native plant restoration. Contribution to workshop "Emerging Silvicultural technologies for *Acacia koa* restoration". Sponsored in part by USDA-NRCS Conservation Innovation Grant Agreement 69-9251-8-794. Hilo, HI. Participants: >20
- Jan 2010. The benefits and challenges of a Sunn Hemp (*Crotalaria juncea*) groundcover intercropped with organic Papaya. Field day sponsored by Western SARE Professional Development Program Project no. EW08-013. Hoolehua, HI. Participants: >10
- Sep 2009. Renovation of fireweed-infested pastures with herbicide applications (preliminary results). Workshop contribution to the Stockman's Fall Field Day. Kamuela, HI. Participants: >20
- Aug 2009. Koa Pasture Scarification, Silvopasture, and Plantation. Field day sponsored in part by USDA-NRCS Conservation Innovation Grant Agreement 69-9251-7-776. Paauilo, HI. Participants: >20

Other scholarly products (such as major software, video or film)

The Dissected Archeological Site Clearing (DASC) ArcMap® tool for planning vegetation management activities at Kaloko-Honokohau NHP. October 2012. An Arc Toolbox function as a work plan tool for customized vegetation clearing activities at Kaloko-Honokohau National Historical Park. Value inputs based on empirically recorded management activities (*i.e.* cutting hauling, etc.) overlaying vegetation class and road network layers allows an individual to calculate resource needs and time estimated to accomplish designated projects.

Virtual Field Day Video Outputs

Utilizing on youtube.com as a medium for generating short-term outcomes disseminating knowledge and awareness on new technologies

Date	Title	Time	Views
Apr 2010	Efficiency of Incision Point Applications on <i>Schinus terebinthifolius</i>	0:03:23	1,170
Apr 2010	Rapid Fire Targeting of Gorse with HBT	0:03:18	894
Mar 2010	Wet Blade management of Guinea Grass	0:03:04	1,836
Nov 2009	Utilizing Wet Blade® to control Fireweed-Results	0:01:55	742
Dec 2009	Thinning, Fertilization and Herbicide Trials to improve Koa production	0:06:32	353
Dec 2009	Utilizing Wet Blade® to control <i>Rauvolfia vomitoria</i>	0:03:02	769
Nov 2009	Utilizing Wet Blade® to control Fireweed	0:02:38	761
Oct 2009	Injection Methods for Controlling Albizia	0:09:07	11,461
Sep 2009	New Herbicides in Fireweed Management	0:05:22	4,291
Aug 2009	Herbicide Trials on kikuyu grass at Volcano National Park	0:09:10	1,003
Aug 2009	Herbicide Trials on meadow rice grass at Volcano National Park	0:04:41	279
Aug 2009	Grass Suppression for Koa Regeneration	0:07:03	624
Jul 2009	Establishing Silvopastures with <i>Acacia Koa</i>	0:09:25	1,275
May 2009	Herbicide Ballistic Technology™ for Miconia Control on Maui	0:05:07	856
May 2009	Miconia on Maui: Winning the Battles but the War Wages On	0:05:44	580

Mar 2009	HBT™ Results for Long Range Control of Invasive Weeds	0:03:11	1,054
Feb 2009	RESULTS: Rauvolfia vomitoria 100 days later	0:07:35	613
Feb 2009	A Case Study in Rapid Response: <i>Rauvolfia vomitoria</i>	0:08:52	551
Jan 2009	HBT™ Herbicide Ballistic Technology for Controlling Fountaingrass	0:05:09	1,003
Dec 2008	PART 3: Evaluating Native Hawaiian Groundcovers	0:02:15	997
Dec 2008	PART 2: Evaluating Native Hawaiian Groundcovers	0:07:13	548
Dec 2008	PART 1: Evaluating Native Hawaiian Groundcovers	0:10:37	1,584
Oct 2008	HBT™ for Control of Photinia	0:05:15	1,147
Sep 2008	HBT™ Research Trials for controlling Invasive Trees	0:09:19	1,041
Sep 2008	HBT™: Herbicide Ballistic Technology	0:06:53	6,624
Jul 2008	Koa Regeneration: Hands-free spraying for Koa Corridors	0:05:34	319
		Total	2:31:24
			42,375

View counts updated 04/18/2015

Please visit <http://www.youtube.com/user/HawaiiRREA> and

<http://www.youtube.com/user/HIsustainAg>

Outreach and popular media

- Anonymous. Feb. 2016. Heroes in the Fight Against Invasive Species Honored at Capitol
<http://dlnr.hawaii.gov/hisc/news/hisaw2016/>
- Hauff, R. Nov. 2014. Big Trees Need Big Solutions. Hawaii Landscape. Landscape Industry of Hawaii. <https://www.hawaiiscape.com/landscape-hawaii-magazine/>
- Klujath, L. Nov. 2014. On a Mission to Seek and Destroy. Vistas Magazine. Vol. 27 issue 3. TBD.
http://www.dowagro.com/vm/news/vistas/vistas_home.htm
- Hurley, T. Aug 2014. Experts warn of risk to the entire state: With the invasive albizia spread across Hawaii, damage similar to Puna could happen in other communities. Star Advertiser. <http://www.staradvertiser.com>. Posted 01:30 a.m. HST, Aug 20, 2014.
- Tran, C. Feb 2014. Albizia trees are a growing problem in Hawaii. Published 8:15 PM HST Feb 21, 2014. Broadcast on ABC affiliate KITV4 News Channel Honolulu, HI.
<http://www.kitv.com/news/hawaii/albizia-trees-are-a-growing-problem-in-hawaii/24612438>
- Borel, B. Nov 2013. Zapping Invasive Plants from A Helicopter. Popular Science. Posted 11.29.2013 at 10:33 am. <http://www.popsci.com/blog-network/our-modern-plagues/zapping-invasive-plants-helicopter>
- Nuwar, R. Jul 2013. In Hawaii, Scientists Are Battling Invasive Plants with Herbicide-Shooting Paintball Guns. Smithsonian.com. <http://www.smithsonianmag.com/smart-news/in-hawaii-scientists-are-battling-invasive-plants-with-herbicide-shooting-paintball-guns-16309724/?no-ist>
- Gutierrez, B. Jul 2013. Paintball guns the latest weapon against invasive plant species. Posted: Jul 20, 2013 4:42 PM Updated: Jul 20, 2013 7:29 PM. Broadcast on CBS affiliate Hawaii News Now KGMB Honolulu, HI.
<http://www.hawaiinewsnow.com/story/22893437/paintball-guns-the-latest-weapon-against-invasive-plant-species>

- Choi, K. Jul 2013. Kauai scientists use paintball guns to combat invasive plant species. Updated: 12:27 AM HST Jul 20, 2013 Broadcast on ABC affiliate KITV 4 Honolulu, HI.
<http://www.kitv.com/news/hawaii/Kauai-scientists-use-paintball-guns-to-combat-invasive-plant-species/-/8905354/21081834/-/21477uz/-/index.html>
- D'Angelo, C. Jul 2013. Miconia down-Herbicide ballistics used to combat invasive species on Kauai. The Garden Island. Posted: July 19, 2013 1:45 AM.
http://thegardenisland.com/news/local/miconia-down/article_6efea176-f037-11e2-8dcb-0019bb2963f4.html
- Tummons, P. Mar 2013. Paintball Poison: Airborne Marksmen To Take Aim At Invasive Plants. Civil Beat. Posted March 7, 2013.
<http://www.civilbeat.com/articles/2013/03/07/18537-paintball-poison-airborne-marksmen-to-take-aim-at-invasive-plants/>
- Sarhangi, S. Feb 2013. Environment: Weed Wars. In the fight against invasive plants, conservationists are bringing out the small guns. Honolulu Magazine.
<http://www.honolulumagazine.com/Honolulu-Magazine/February-2013/Weed-Wars/>
- Leary, J. Nov 2012. Release Secusio: Transitioning to a Biocontrol Management Program for Fireweed (*Senecio madagascariensis*) on Maui. Hana'ai.
<http://www.ctahr.hawaii.edu/sustainag/news/articles/V13-Leary-secusio.pdf>
- Anonymous. Oct 2012. Nelson Paint Co. creates pesticide product for use in Hawaii. The Iron Mountain Daily News. Posted October 20, 2012
<http://www.ironmountaindailynews.com/page/content.detail/id/537343/Nelson-Paint-Co--creates-pesticide-product-for-use-in-Hawaii.html?nav=5002>
- Pignataro, A. May 16, 2012. James Leary Battles Miconia with a Paintball Gun- BEST JOB EVER. Maui times. Posted: May 16, 2012 9:14 am.
<http://www.mauitime.com/Articles-News-i-2012-05-17-76758.113117-James-Leary-Battles-Miconia-With-a-Paintball-Gun-While-the-State-of-Hawaii-Sort-Of-Opens-Old-Haleakala-Trail.html>
- Adams, L. Jul 2011. Herbicide paint balls help fight Wyoming weeds. Broadcast on NBC affiliate KCWY News13 for Wyoming. <http://www.nbcnews.com/video/nbc-news/43836447/#43836447>
- Leary, J. Aug 2010. Noxious tumbleweed rolls on Maui. Ki'ai Moku Column (Maui News).
<http://www.mauinews.com/page/content.detail/id/534196.html>
- Fox, L. Feb 2010. New technology pivotal amid fight against invasive weeds. Ki'ai Moku Column (Maui News). <http://www.mauinews.com/page/content.detail/id/528660.html>
- Paynter, B. Feb 2010. Green Avenger: Botanical Guardian Assaults Alien Flora. Wired Magazine.
http://www.wired.com/magazine/2010/01/st_weedwhacker/
- Pennisi, E. Sep 2003. Fixers in the Sky. Science. 301 pg. 1467. DOI: 10.1126/science.301.5639.1467b
<http://www.sciencemag.org/content/301/5639/1467.2.summary>

Professional Memberships and Service

Invasive Plant Science and Management Journal (associate editor)
 Western Society of Weed Science (active member)

Maui Invasive Species Committee (active member)
Oahu Invasive Species Committee (active member)
CTAHR Faculty Senate Executive Committee 2015-present
NREM Marketing and Promotions Committee 2015-present

Awards and Honors

Feb. 2016. Hawaii State Senate Proclamation Honoring Hawaii Invasive Species Awareness
Week Award Recipient for Maui County MVP
Feb. 2015. Weed Science Society of America Award for Outstanding Paper in the Journal
Invasive Plant Science and Management