

Minnesota Invasive Terrestrial Plants and Pests Center

Dr. Rob Venette, Director

College of Food, Agricultural,
and Natural Resource Sciences

October 19, 2015



UNIVERSITY OF MINNESOTA
Driven to DiscoverSM

Mission of MITPPC



“The purpose of [MITPPC] is to **research and develop effective measures** to prevent and minimize the threats posed by terrestrial invasive plants, pathogens, and pests ... to protect the state’s native prairies, forests, wetlands, and agricultural resources.”
[ML 2014, Ch. 312, Sec 44]



Mission of MITPPC



“The purpose of [MITPPC] is to research and develop effective measures to prevent and minimize the threats posed by terrestrial invasive plants, pathogens, and pests ... to **protect the state’s native prairies, forests, wetlands, and agricultural resources.**”
[ML 2014, Ch. 312, Sec 44]



Mission



- Offer science-based solutions to problems posed by terrestrial invasive species on all lands.
- Educate and train the next generation of scientists to address these complex problems.
- Deliver workable techniques and technologies to stakeholders.



Vision for MITPPC



Driven to Discover
Solutions!

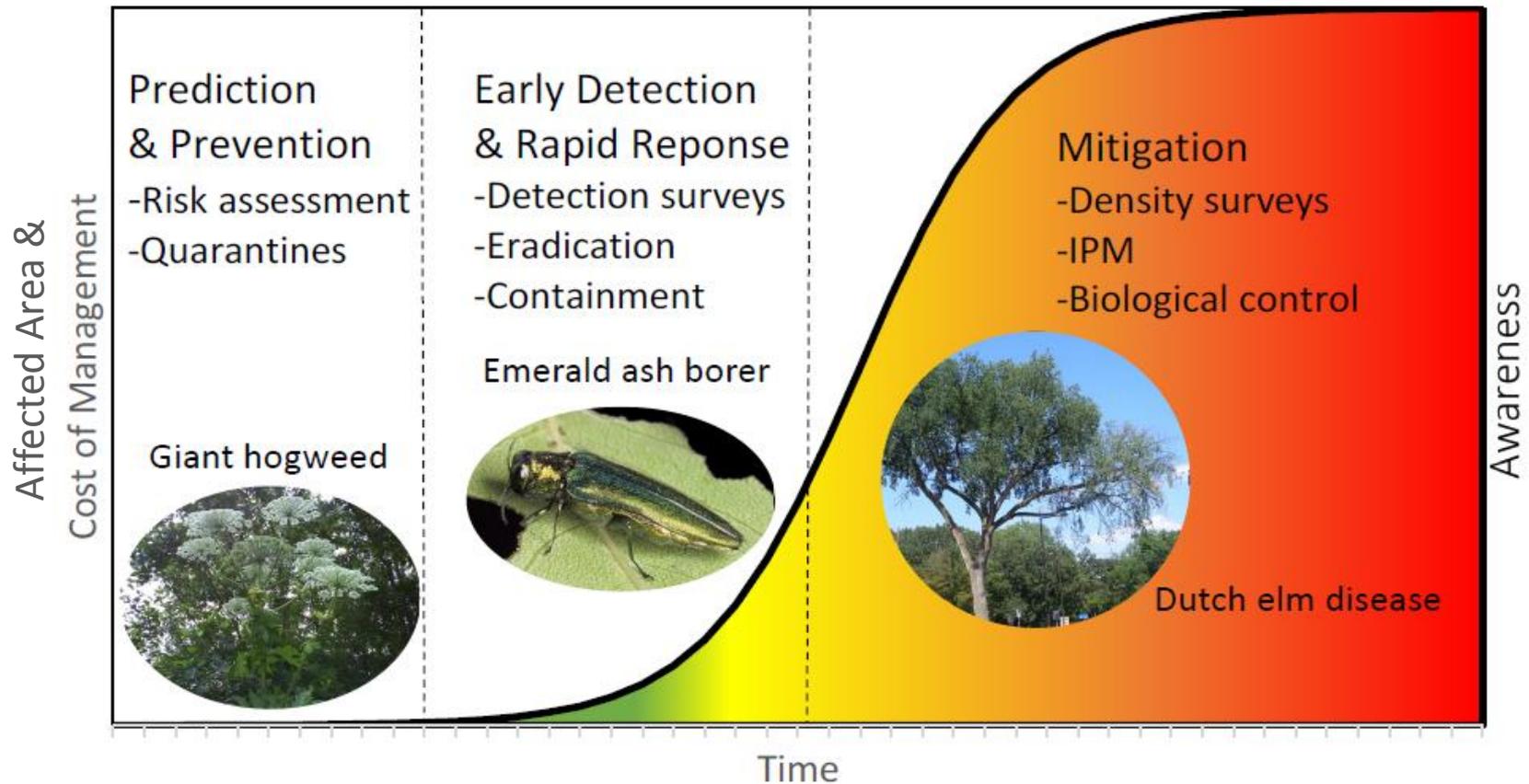
Productive Partnerships
Sustainable Science

-
- Engage
 - Prioritize
 - Coordinate
 - Leverage
 - Conduct
 - Communicate



UNIVERSITY OF MINNESOTA
Driven to DiscoverSM

Invasive Terrestrial Plants and Pests Center: Requires Multi-Disciplinary Response



Invasive Terrestrial Plants and Pest Center: Why a CFANS-administered center?

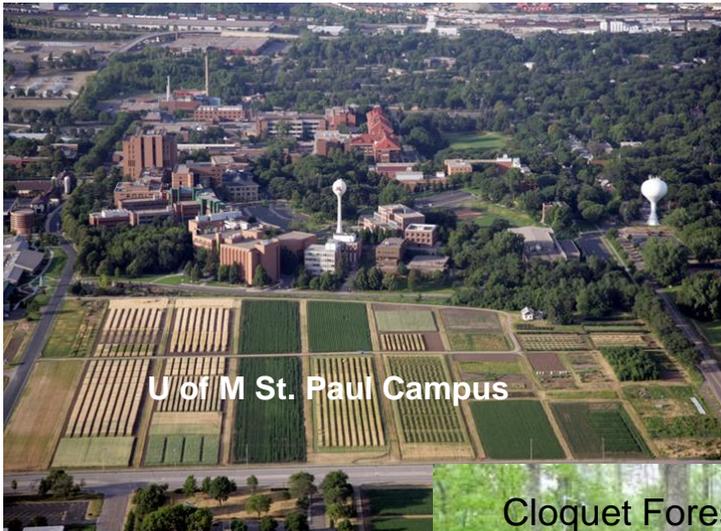


Spotted wing drosophila

- Dollars targeted for impact.
- Coordinated multi-disciplinary approach. Access to top faculty.
- **Graduate student training expanding future impact.**
- Structured rapid response to be flexible and preventive.
- Regional ROCs for field research.
- Collaborative with State agencies, NGO's, LCCMR, others.



Invasive Terrestrial Plants and Pests Center: U of M Multi-Disciplinary Research Capacity

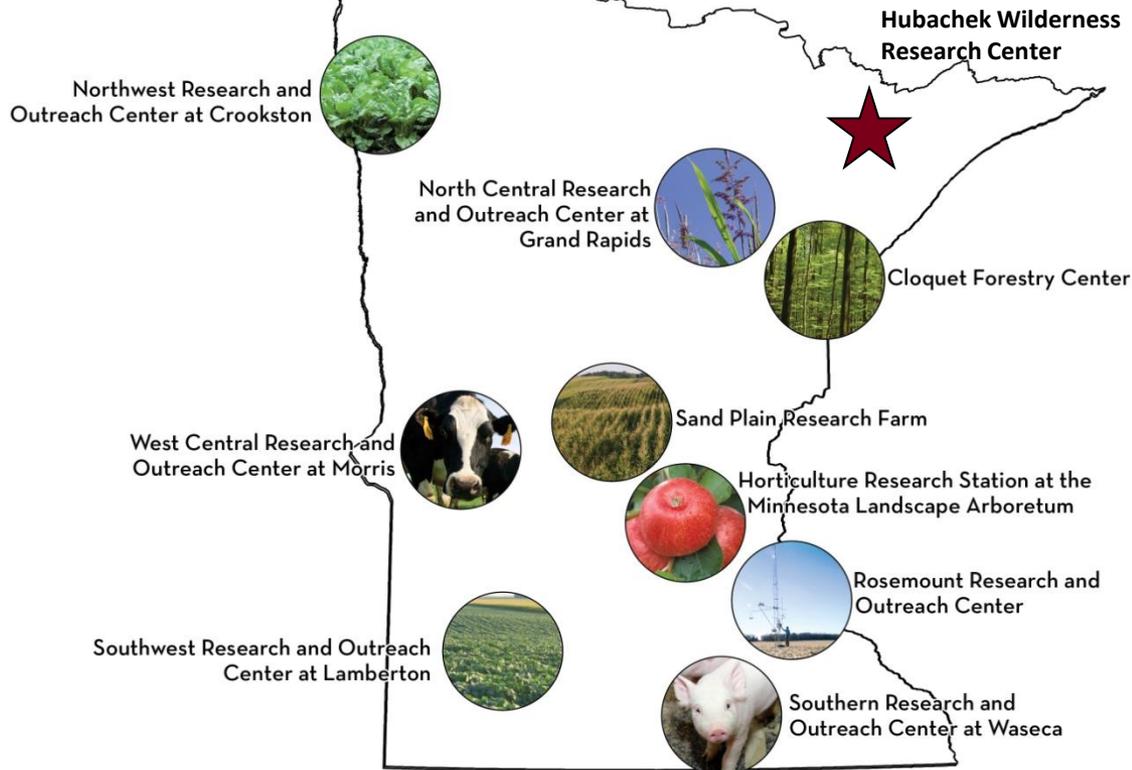


- Entomology
- Plant Pathology
- Forest Resources
- Horticultural Science
- Applied Economics
- Fisheries, Wildlife, Cons Bio.
- Agronomy
- Bio-Engineering
- Plant Biology & EEB (CBS)
- 8 Research Outreach Centers



Invasive Terrestrial Plants and Pest Center: U of M Research Capacity State-Wide

Research and Outreach



Research and Outreach Centers are engaged in regional research projects and help us address regional differences in invasive species problems and impacts.

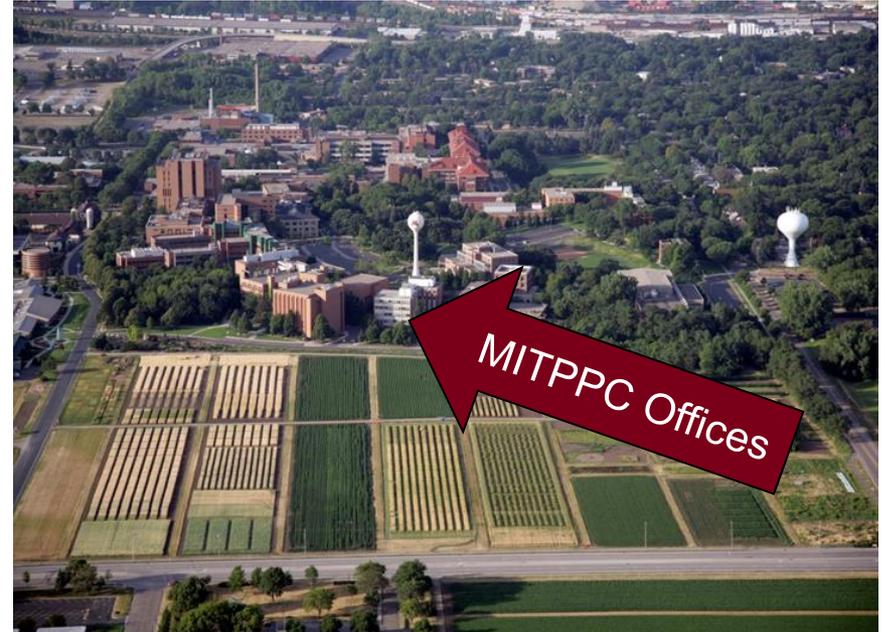


Work with State Agencies and Extension



Funding and startup of MITPPC

- Current Funding
 - \$3.4 mill. General Fund
 - \$1.46 mill. ENRTF 2014
 - \$5 mill. ENRTF 2015
- Pending funding
 - \$5 mill. LCCMR 2016
- Startup
 - Jan. 2015 - Hired, Director, MITPPC
 - May 2015 – Hired, Associate Director, MITPPC (Heather Koop)
 - Sept. 2015 – Center Advisory Board meets for first time
 - Current MITPPC funding ends June 30, 2023.



MITPPC Center Advisory Board

Chair: Bob Stine

Ex officio members

Commissioner Tom Landwehr, Department of Natural Resources

Commissioner Dave Frederickson, Department of Agriculture

Dean Brian Buhr, CFANS

Representatives for ex officio members

Ann Pierce, Department of Natural Resources

Matthew Wohlman, Department of Agriculture

Greg Cuomo, Associate Dean for Research, CFANS

Rotating members: internal to University

Vince Fritz, University of Minnesota Research and Outreach Centers

Frances Homans, Head, Department of Applied Economics

Emily Hoover, Head, Department of Horticultural Science

Gary Muehlbauer, Head, Department of Plant Biology, College of Biological Sciences

Bob Stine, Associate Dean, College of Continuing Education

Rotating members: external to University

Nan Bailly, Alexis Bailly Vineyards

Steve Chaplin, The Nature Conservancy

Reginald De Foe, Fond du Lac Band of Lake
Superior Chippewa

Shefali Mehta, Syngenta

Bob Owens, Owens Forest Products



UNIVERSITY OF MINNESOTA

Driven to DiscoverSM

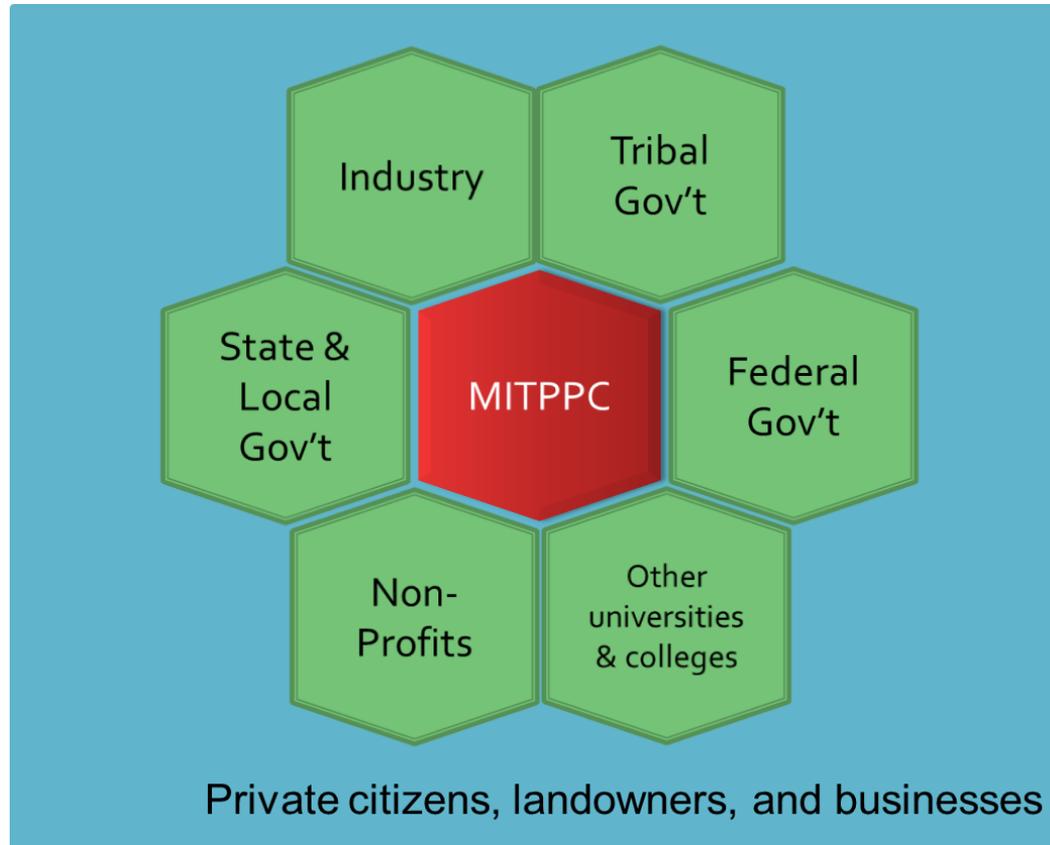
Invasive Terrestrial Plants and Pests Center: Structure and Staffing



- Multidisciplinary Center:
 - Director + Associate Director (Report to CFANS)
 - Center Faculty Group
 - Center Advisory Board
- Research staffing and funding
 - Administered by Departments and Faculty
 - Reporting and accountability to the Center



The successes of the Center and our partners are interconnected



RFP and project selection process



UNIVERSITY OF MINNESOTA

Driven to DiscoverSM

Rapid research prioritization



Goal: Identify pressing research needs among partner organizations and launch initial research projects



Involved 4 agencies

Brainstorm research topics for MITPPC

Select top 4 research priorities

- Help agency achieve mission
- Other agencies might benefit
- In-kind or \$ support from agency
- Could be completed at the U of M



Vetted March 26, 2015 to select initial priority themes and taxa



UNIVERSITY OF MINNESOTA

Driven to DiscoverSM

Invasive Terrestrial Plants and Pests Center: Rapid Prioritization-Top Research Taxa



**Brown marmorated
stink bug**



Oak wilt

UGA4215066b



UNIVERSITY OF MINNESOTA

Driven to DiscoverSM

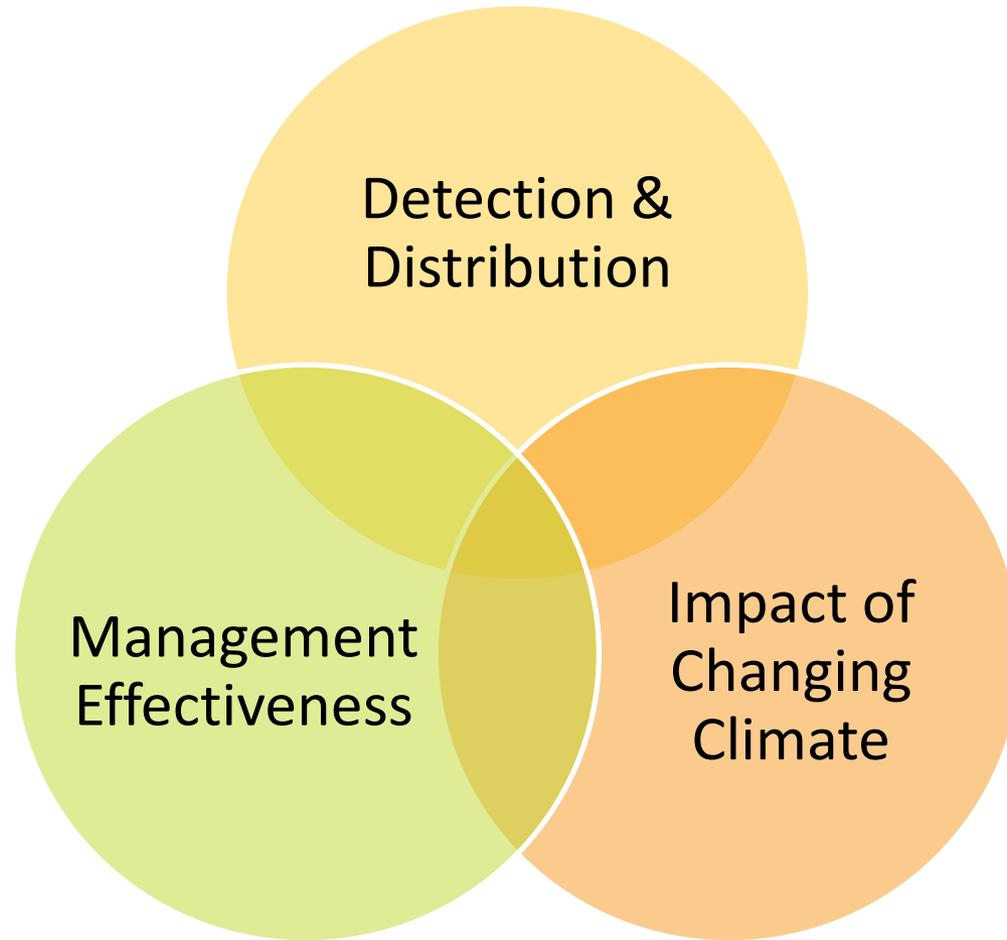
Invasive Terrestrial Plants and Pests Center: Rapid Prioritization-Top Research Taxa

25 NOXIOUS WEEDS

- **Eradicate list**
 - Palmer Amaranth, *Amaranthus palmeri*
 - Oriental Bittersweet, *Celastrus orbiculatus*
 - Brown Knapweed, *Centaurea jacea*
 - Yellow Star Thistle, *Centaurea solstitialis*
 - Meadow Knapweed, *Centaurea x moncktonii*
 - Black Swallow-wort, *Cynanchum louiseae*
 - Grecian Foxglove, *Digitalis lanata*
 - Common Teasel, *Dipsacus fullonum*
 - Cut-leaved Teasel, *Dipsacus laciniatus*
 - Giant Hogweed, *Heracleum mantegazzianum*
- Japanese Hops, *Humulus japonicas*
- Dalmatian Toadflax, *Linaria dalmatica*
- **Control list**
 - Narrowleaf Bittercress, *Cardamine impatiens*
 - Plumeless Thistle, *Carduus acanthoides*
 - Spotted Knapweed, *Centaurea stoebe* spp. *micranthos*
 - Canada Thistle, *Cirsium arvense*
 - Leafy Spurge, *Euphorbia esula*
 - Purple Loosestrife, *Lythrum salicaria*, *virgatum*
 - Wild Parsnip, *Pastinaca sativa* (Except for non-wild cultivated varieties)
- Common Tansy, *Tanacetum vulgare*
- **Restricted noxious weeds**
 - Garlic Mustard, *Alliaria petiolata*
 - Glossy Buckthorn (and all cultivars), *Frangula alnus* Mill (*columnaris*, *tallcole*, *asplenifolia* and all other cultivars)
 - Common Reed - non-native subspecies, *Phragmites australis* ssp. *australis*
 - Common or European Buckthorn, *Rhamnus cathartica*
 - Multiflora Rose, *Rosa multiflora*



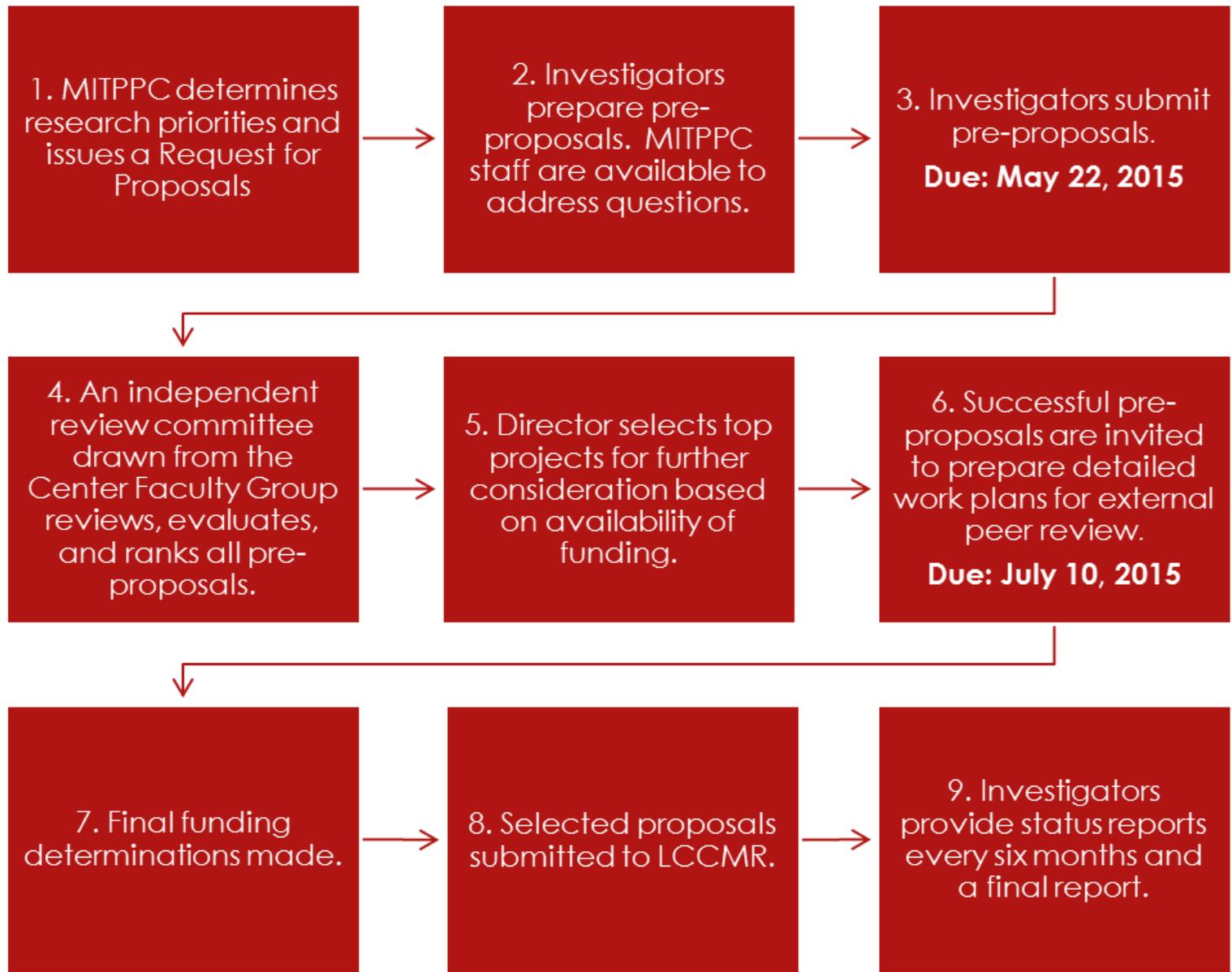
Invasive Terrestrial Plants and Pests Center: Rapid Prioritization-Top Research Themes



UNIVERSITY OF MINNESOTA

Driven to DiscoverSM

First RFP issued April 30, 2015

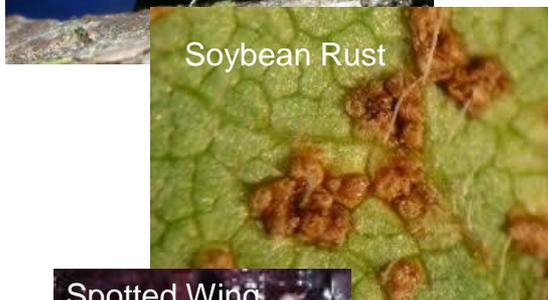


Invasive Terrestrial Plants and Pests Center: Response to initial request for proposals

- 8 proposals received (total \$3.7 Million)
 - Goal: Allocate \$1.2 Million in first round
- Reviewed by 5 faculty members
- Four invited to submit full research proposals
- Technical reviews by experts outside MN.



Expanded prioritization



- Goal: Identify invasive plants and pests that pose the greatest threat to Minnesota forests, prairies, wetlands, and agriculture and for which research will have greatest impact.
- “4” experts on each of 3 prioritization panels (plants, pathogens, and insects/arthropods)
- Each panel begins with the selection of “40” threatening species (120 in total).



Prioritization panels



Invasive plants	Invasive insects	Invasive plant pathogens
Rebecca Montgomery*- Forest Resources	Brian Aukema*- Entomology	Deborah Samac*- USDA-ARS/Plant Pathology
Roger Becker- Agronomy	Bob Koch- Entomology	Bob Blanchette-Plant Pathology
Laura Van Riper-DNR	Val Cervenka-DNR	Susan Burks/Brian Schwingle-DNR
Monika Chandler/Tony Cortilet-MDA	Mark Abrahamson- MDA	Kathy Kromroy-MDA

* Panel chair



Criteria to measure and compare threats

- Probability of Invasion
 - Arrival
 - Proximity to MN
 - Existence of pathways
 - Innate dispersal capacity
 - Establishment and persistence
 - Climatic suitability
 - Presence of hosts
 - Hybridization/host shift
 - Spread
 - Human-mediated pathways
 - Dispersal capacity
 - Movement
 - Reproductive Capacity
 - Extent of spread
 - Existence of vectors (non-human)
- Magnitude of Impact
 - Problem elsewhere
 - Economic impacts
 - Impacts to yield or marketability
 - Costs of mitigation (including quarantines)
 - Recreation or real estate
 - Environmental impacts
 - Consequences to native species
 - Consequences to ecosystem services
 - Human health impacts
 - Facilitate other invasions

6 Graduate Students reviewing literature for answers



Outreach and Education



UNIVERSITY OF MINNESOTA

Driven to DiscoverSM

Outreach and Education

- Current strategy relies on existing infrastructure.
- Contemplating additional funding for this component (intermediate need?)
- Challenge is to find-added value.



Expected outcomes



UNIVERSITY OF MINNESOTA

Driven to DiscoverSM



Photo from The Nature Conservancy



UNIVERSITY OF MINNESOTA
Driven to DiscoverSM

Thank You and Questions?

- Dr. Rob Venette, Director:
venet001@umn.edu

- Ms. Heather Koop, Assoc. Director:
hkoop@umn.edu

