

**Environment and Natural Resources Trust Fund
2018 Request for Proposals (RFP)**

Project Title:

ENRTF ID: 141-D

Palmer Amaranth Detection and Eradication Continuation

Category: D. Aquatic and Terrestrial Invasive Species

Total Project Budget: \$ 431,200

Proposed Project Time Period for the Funding Requested: 2 years, July 2018 to June 2020

Summary:

Find and control Palmer amaranth in conservation plantings to prevent severe economic damage and protect prairies.

Name: Monika Chandler

Sponsoring Organization: Minnesota Department of Agriculture

Address: 625 Robert Street North
St. Paul MN 55155

Telephone Number: (651) 201-6537

Email Monika.Chandler@state.mn.us

Web Address <http://www.mda.state.mn.us/plants/pestmanagement/weedcontrol/noxiouslist/palmeramarant>

Location

Region: Statewide

County Name: Statewide

City / Township:

Alternate Text for Visual:

Map top left shows Minnesota with Yellow Medicine and Lyon Counties highlighted. Image top right is of Palmer amaranth seedheads. Bottom image is of a person torching Palmer amaranth.

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ TOTAL	_____ %



PROJECT TITLE: Palmer Amaranth Detection and Eradication Continuation

I. PROJECT STATEMENT

Palmer amaranth is an invasive plant that threatens row crop production and prairies. Growing quickly at 2-3 inches per day and reaching heights of 10 feet tall, it outcompetes other plants. Palmer amaranth is an annual that produces prolific seed – up to a million per plant. It developed resistance to multiple classes of herbicides making it challenging to control. Palmer amaranth can cause yield losses up to 91% in corn (Weed Sci. 49:202-208) and 78% in soybeans (Weed Sci. 51:37-43). It has invaded established prairies in Illinois.

Palmer amaranth was first found in Minnesota in fall 2016 and declared an agricultural emergency. Palmer amaranth seed was a contaminant of a conservation seed mix that was planted at 30 locations. Infrastructure developed with our *Elimination of Target Invasive Plant Species* LCCMR project and Minnesota Department of Agriculture (MDA) emergency funds enabled us to respond quickly. Palmer plants, including seedheads, were incinerated to reduce establishment and spread. There are currently less than 200 acres of Palmer amaranth in Minnesota and the density is low. Rapid and effective management now could prevent statewide establishment and spread. We will

- **Intensively monitor sites with Palmer amaranth.** Vegetation at Palmer sites will be monitored closely to identify Palmer plants before seed is produced. Palmer germinates throughout the growing season so monitoring the entire season is needed. Palmer amaranth seedbanks are not long-lived so aggressive management now could eradicate Palmer from these sites.
- **Continue control efforts at sites with Palmer amaranth.** Control methods may include flame weeding with torches, prescribed fire, spot treatment, increased plant competition by seeding more native grasses and, if necessary, broadcast herbicide application (ENRTF dollars will not be used for broadcast application).
- **Conduct ground and aerial surveys.** Additional conservation planting will be surveyed for Palmer amaranth presence or absence. Aerial survey will increase efficiency of ground survey by advance scouting for Palmer or similar looking plants. It will also reduce the amount of field entries and exits thereby reducing the risk of inadvertent spread of Palmer.

We received funding from the emerging issues account to begin this work in 2017. We are requesting continuation funding.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: Develop and utilize aerial survey methods (U of M) Budget: \$ 159,700

Remote sensing will be utilized with the goal of developing methods to identify probable Palmer amaranth by aerial survey. This will increase the efficiency of ground survey by identifying areas with possible Palmer amaranth plants. We request to use project funds for out of state travel to areas where Palmer is more common such as Iowa for method testing.

Outcome	Completion Date
1. Test remote sensing tools and methods.	03/31/20
2. Identify areas with Palmer or similar looking plants for targeted ground surveys.	06/30/20

Activity 2: Monitor, ground survey and control (MDA and CCM) Budget: \$ 271,500

We will regularly monitor existing infestations to look for Palmer and determine control steps needed. We will survey additional conservation plantings on the ground. Prescribed fire and flame weeding are methods that



will control Palmer amaranth while benefitting native species in conservation plantings. Additionally, these methods will not lead to herbicide resistance development.

Outcome	Completion Date
1. Infestations will be monitored during the growing season a minimum of three times per year. Palmer plants will be controlled prior to seed development. Currently there are 30 locations to monitor in Lyon and Yellow Medicine Counties.	06/30/20
2. At least 75 additional conservation plantings statewide are surveyed each year for the presence/absence of Palmer amaranth. Selection of sites to survey will be based on geographic distribution and newer plantings will be prioritized.	06/30/20
3. Investigate potential infestation reports from the public and agency partners. We anticipate approximately 300 reports per week during the growing season.	06/30/20
4. Utilize prescribed fire and flame weeding to control Palmer amaranth.	06/30/20

III. PROJECT STRATEGY

A. Project Team/Partners

Receiving funds: Monika Chandler (MDA) will lead infestation monitoring, ground survey and report follow up. She will also provide overall project coordination. Demoz Gebre Egziabher (U of M) will lead the development and utilization of aerial survey methods. Dorian Hasselmann and Dustin Looman (CCM) will manage crews and lead Palmer amaranth control activities. Their salaries will not be paid with these funds. All organizations will provide in-kind equipment, facilities and GIS/technical support.

Not receiving funds: We will collaborate with federal and state agencies and private landowners to identify sites to survey and to manage Palmer infestations.

B. Project Impact and Long-Term Strategy

Palmer amaranth eradication would have enormous positive ecological and economic implications. If Palmer amaranth becomes widespread in cropping systems, additional herbicides would be used. This could be detrimental to pollinators and water quality. Crop production costs would increase by an estimated \$20-30 per acre for soybean and \$15-20 for corn production. If half of Minnesota’s 7.4 million acres of soybeans and 8.7 million acres of corn were infested, production costs would increase by approximately 165 million dollars annually. This burden would be borne by farmers and consumers and does not take into account the threat of non-target treatment impacts to surrounding agricultural natural areas. Additionally, Palmer amaranth is becoming problematic in prairie in Illinois and is outcompeting native vegetation. The stakes are high. There is not much Palmer amaranth in Minnesota. Now is the time to control it and keep it out of conservation plantings.

Despite efforts to prevent contaminated seed from entering Minnesota, we anticipate additional introduction of Palmer amaranth. Early detection and rapid response to Palmer amaranth will be an ongoing effort.

C. Timeline Requirements

Emerging issues funding is for 07/01/2017 to 06/30/2018. If continuation funding is secured, standard ENRTF funding would be for two years from 07/01/2018 to 06/30/2020.

2018 Detailed Project Budget

Project Title: Palmer Amaranth Detection and Eradication Continuation

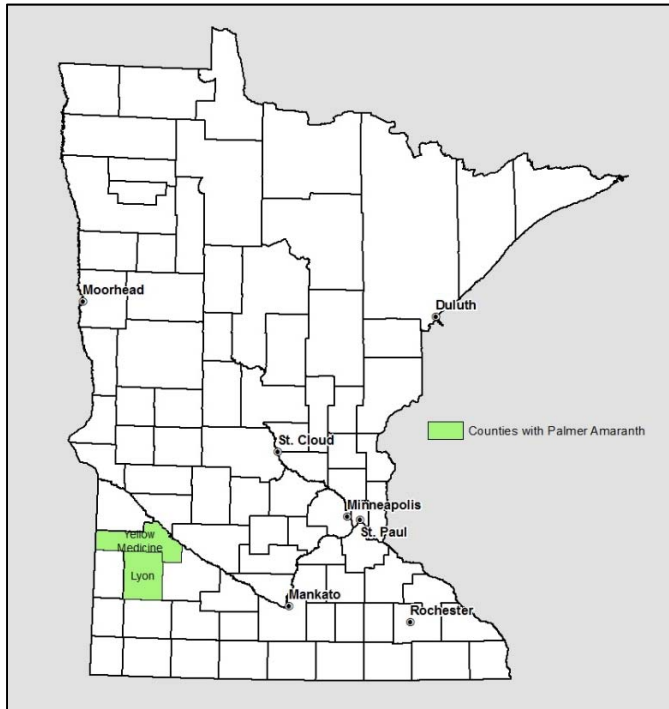
IV. TOTAL ENRTF REQUEST BUDGET 2 years

BUDGET ITEM	Amount
MDA Personnel: One 2 year 60% time Plant Health Specialist position estimated salary \$42,000 per year plus fringe benefits @ 43% for Activity 2	\$156,300
Professional/Technical/Service Contracts: Contract with Conservation Corps Minnesota for Palmer amaranth survey and management in conservation areas. Management methods include spot herbicide application, flame weeding and prescribed burning. Training and equipment (tools and personal protective equipment such as fire retardant clothing, gloves, hardhats, etc.) for crews (control and survey) and field specialists (survey) is included.	\$98,000
Professional/Technical/Service Contracts: Contract with University of Minnesota to develop and utilize aerial survey methods. Costs include a 50% time engineer \$126,100 (salary \$94,575 and fringe @ 25% \$31,525), travel \$15,800 (mileage \$10,800 and meals and lodging \$5,000), equipment \$10,000 (airframe and sensors 2 @ \$4,000 each and ground station \$2,000) and other (repairs \$2,000 and specialized pix4d software license \$5,000)	\$159,700
MDA Supplies: Herbarium supplies, flagging materials, etc.	\$1,000
MDA Travel: Mileage @ 53.50¢ for 17,000 miles (\$9,000), approximately 40 days of lodging (\$4,000) and 94 days of meals/yr (\$3,200) per year.	\$16,200
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =	\$431,200

V. OTHER FUNDS

SOURCE OF FUNDS	AMOUNT	STATUS
In-kind Services To Be Applied To Project During Project Period: MDA: Overhead, field equipment, computing/software, GIS and data management, and project management for 3 years (\$24,000); U of M: UAV Lab equipment for 3 years (\$20,000); and CCM: Approximately \$2.50/hr difference between actual cost per member (\$23.50/hr) and billing rate (\$21.00/hr) = \$11,670.	\$ 55,670	Secured
Current ENRTF Appropriation: 2017 Palmer Amaranth Detection and Eradication with funding from Emerging Issues Account	\$173,000	Secured
Current ENRTF Appropriation: 2017 Elimination of Target Invasive Plants - Phase 2 project M.L. 2016, Chp. 186, Sec. 2, Subd. 06e1 and Subd. 06e2	\$ 750,000	Spent or obligated
Past ENRTF Appropriation: 2017 Elimination of Target Invasive Plants - Phase 1 project M.L. 2013, Chp. 52, Sec 2, Subd. 06d	\$ 350,000	Spent
Other Funding History: MDA Emergency Funds	\$ 100,000	Spent or obligated

Palmer Amaranth Detection and Eradication



Palmer amaranth was detected in Yellow Medicine and Lyon Counties.



Palmer amaranth's long seedheads produce a lot of seed that enables spread.



Conservation Corps Minnesota torching Palmer amaranth in a conservation planting

Project title: Palmer Amaranth Detection and Eradication

Qualifications

Project Manager: Monika Chandler, M.S., Biological Control and Invasive Plant Management Coordinator, Minnesota Department of Agriculture

Monika has worked with invasive plants for 17 years. She is currently the project manager for the LCCMR projects titled *Elimination of Target Invasive Plant Species – Phase 2* and *Biosurveillance and Biocontrol of Emerald Ash Borer – Phase 2*.

Her responsibilities with invasive plant management are to:

- Facilitate identification/species determination
- Aid infestation delineation, quantification, and mapping
- Compile suggested practices from literature, weed scientists and land managers for management recommendations
- Coordinate management efforts with public and private partners
- Communicate about species of concern with land managers in Minnesota and neighboring states.
- Work with local partners to implement biological control of invasive plants where appropriate.
- Write risk assessments for and present species of concern to the Noxious Weed Advisory Committee for evaluation. This committee makes formal recommendations to the Commissioner of Agriculture about listing and categorizing species as regulated noxious weeds.

Organization Description

The Minnesota Department of Agriculture's Plant Protection Division will lead infestation monitoring, ground survey, report follow up and provide overall project coordination. The Minnesota Department of Agriculture is authorized to eradicate and prevent the spread of harmful or dangerous plants pests in Minnesota by MN Statute 18G.03 subd. 1(e) (2008).