

Appendix A: Prevention of Palmer Amaranth and other Noxious Weeds in Conservation Projects

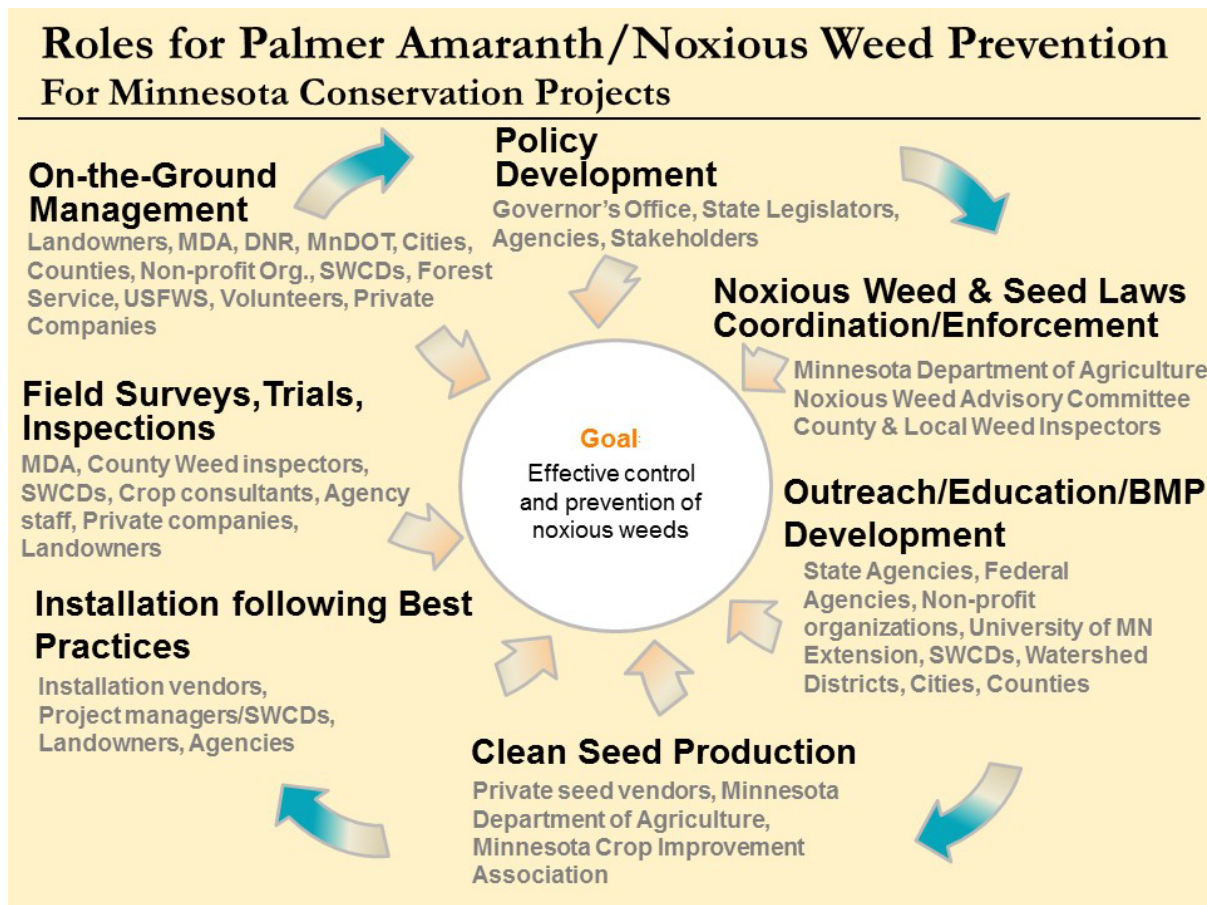
Guidance for Project Managers and Vendors

The introduction of *Palmer Amaranth* and other noxious weeds through seed and seed mixes is a major concern in Minnesota. It is important that [MN and federal seed laws](#) are followed for all projects and that other steps are taken to prevent introduction of noxious weeds. The following diagrams summarize stakeholder roles in noxious weed prevention (Diagram 1) and specific steps for prevention of noxious weeds in conservation plantings (Diagram 2). The diagrams are followed by detailed information about methods for addressing *Palmer Amaranth and other noxious weeds in conservation plantings*. The information summarizes the role of project managers, local governments, vendors, landowners and agencies.



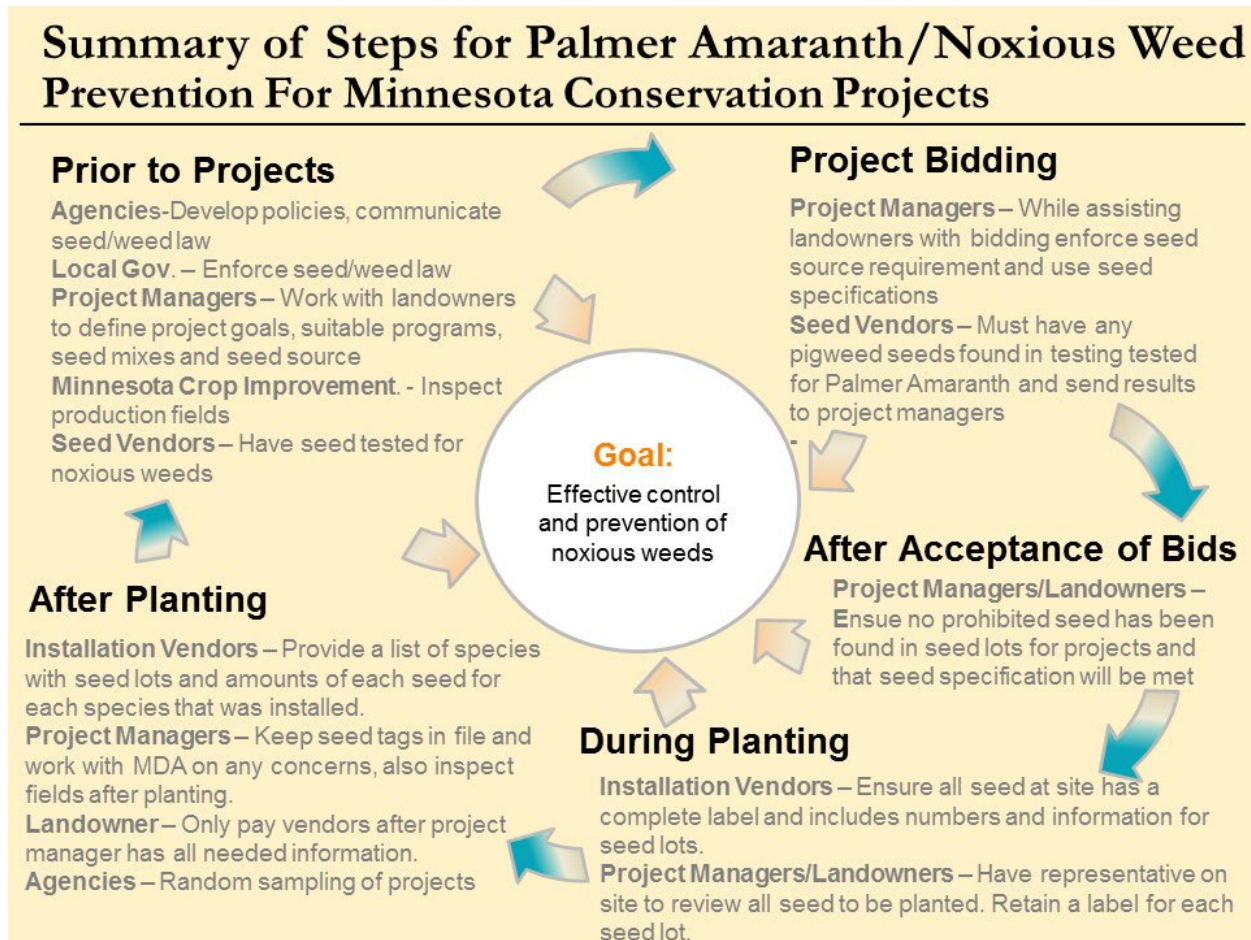
Palmer amaranth

Diagram 1



Figures 1-3 provide examples of a label, seed testing results, and DNA tests all needed to properly label native forb seed mixtures for sale and Figure 4 is a seed specification that can be included as part of project bids to address noxious weed issues.

Diagram 2



Methods for Addressing Palmer Amaranth and Other Noxious Weeds

1) Prior to Projects

Agencies: Minnesota Department of Agriculture (MDA) works with seed vendors to ensure that they know state requirements for meeting state and federal seed law requirements and are taking steps to prevent the introduction of noxious weeds. All vendors with a permit to label seed for sale in Minnesota are listed on the MDA website.

Local Governments: County, city and township officials inspect land and ask owners to control and eradicate noxious weeds that are present to keep them from spreading and harming neighboring lands.

Seed Production Vendors: To comply with the state seed law, any seed being sold must be tested for weed seeds including restricted and prohibited noxious weed seeds. Seed that is harvested from the wild must also be tested for noxious weeds and labeled appropriately.

2) Project Bidding

Project Managers: Seed source requirements defined for projects must be followed and seed can only be purchased from vendors that provide the documentation listed in this guidance and meet other seed specifications for the projects. See the seed specifications below (Figure 4).

Seed Production Vendors: If Amaranth species were found in the purity or noxious weed seed test, MDA requires that the vendor conduct a genetic test to determine if the Amaranth species are Palmer Amaranth. Genetic test results must be made available to MDA during inspections.

3) After Acceptance of Seed Bids

Project Managers: For acceptance of seed bids, project managers must ensure that vendors can meet all seed specifications.

Project Managers: Soon after the acceptance of a seed bid and any final changes to mixes, it is recommended that project managers have seed vendors provide a preliminary seed label/tag for the proposed seed mix(s). The manager should review the noxious weed seed section of the label (Fig. 1C). If any restricted noxious weed seeds are listed, the manager should confirm that in total there are less than 25 restricted noxious weed seeds per pound of the seed mix. A seed mix that contains any prohibited noxious weed seeds is not legal for sale in the state. If seed testing results are available for review (Fig. 2) the manager should review both the weed seed percentage, common weed seed found, and noxious weed seed sections of the Report of Analysis. Some labs provide a comprehensive list of all weed seeds found in the noxious exam. If Palmer amaranth or any Amaranth species is listed in the noxious weed seed section of the report (Fig. 2C), the report should indicate whether genetic testing has been conducted. Most seed mixes are blended after each single species component has been tested, so a project manager may also receive seed testing results for each single component in the mixture. This review step is intended to allow project managers to verify the mix prior to seeding and the seed label/tag can be used to verify that the correct seed has been delivered to the targeted project site.

4) During Planting

Seed Installation Vendors: All seed delivered to sites must have a complete label and mixes must include information for individual seed components and their lot numbers. Installers must allow MDA staff to take seed samples when they arrive for a random planting inspection.

Project Managers: Have a representative on site at planting to review labels and other paperwork for all of the seed to be planted. All seed must be appropriately labeled and mixes must include information for individual seed components and their lot numbers. Reject any seed that does not have a label or does not correspond to the preliminary seed label/tag that was provided after acceptance of the seed bid. If seed substitutions are necessary, all required information must be provided in advance for the project manager's review. Reject any seed that does not have a label, is improperly labeled and/or does not correspond to the preliminary seed label/tag that was provided after acceptance of the seed bid.

Project Managers: Count the number of bags of each seed lot and retain a label for each lot indicating the number of bags at the site on the back of the label. Review the label(s) and contact MDA for a label review if there are any concerns.

5) After Planting

Seed Installation Vendors: Must provide a final list of species (with seed lots) and amounts of seed for each species planted for the project.

Project Managers: Keep the seed tags and a copy of the final list of species planted in the project file. Project managers should work with the MDA if they have any concerns about seed mixes. MDA can assist with taking official seed samples at planting, as needed. MDA also has an official [complaint process](#) for cases where there is reason to believe that a violation of state seed law has occurred.

Landowners: Project payments should not be made to seed installers until coordinating project managers feel confident that they have received all the appropriate seed information for the project. Landowners should periodically inspect fields and report back to the project manager or MDA any observations of excessive weeds or plants of concern.

Project Managers: Project inspections by local staff with plant identification expertise will play an important role as a final assurance that Palmer Amaranth and other noxious weeds are not introduced into plantings.

Agencies: MDA will conduct a noxious weed seed exam on a random sample of native seed mixes collected in each county. They will work with each SWCD to establish a sampling plan for their district that defines a specific number of plantings to be sampled. MDA is also conducting field inspections for Palmer Amaranth and other noxious weeds through grant funding.

Figure 1. Example of a label for a native forb mixture. The lettered sections A, B, and C are related to the Report of Analysis for seed testing in Fig. 2. This seed would not be legal for sale in Minnesota because it contains Palmer Amaranth.

Native Forb Mixture									
Lot BPSIMN1802									
Kind	Variety	Source Lot	Genetic Origin	Pure Seed%	Germination %	Hard or Dormant%	Total Viable%	PLS%	
Partridge Pea	VNS	IA1010	IA	20.71	41	54	95	19.67	
Canada Tick Trefoil	VNS	MN2020	MN	20.18	36	61	97	19.57	
Wild Bergamot	VNS	MN2021	MN	10.05	78	10	88	8.84	
Black-eyed Susan	VNS	MN2023	MN	25.23	85	8	93	23.46	
Hoary Vervain	VNS	MN2024	MN	21.78	45	35	80	17.42	
Purity	97.95	A							
Other Crop	1.87								
Weed Seed	0.17								
Inert Matter	0.01								
Noxious Weeds	#/lb	C							
Giant Foxtail	21 /lb								
Palmer amaranth	11/lb								
Test Date	12/1/2017								
						B			
						Best Prairie Seed In Minnesota 100 Prairie Way Green, MN 11111			

Figure 2. Example of Report of Analysis for seed testing results from a native forb mixture. The purity analysis in section A, the viability analysis in section B, and the noxious weed seed exam in section C, all correspond to the same sections on the seed label in Fig. 1. This report shows a seed lot that is positive for Palmer Amaranth and indicates that genetic testing has been conducted. If this report were for a single species, only one pure seed component would be listed on the purity analysis.

Name and Address of Testing Lab		Laboratory Test Results						
Sample number: 1539087 Date Received 11/2/2017 Report Date: 12/19/2017		Sender's Information Kind: Native Forb Mixture Varieties: Not Stated Lot Number: BPSIM1802 Origin: MN, IA Bag Weight: Not Stated Size of Lot: Not Stated Labeler's Name: Best Prairie Seed in Minnesota. Product Name: Native Forb Mixture Date Sampled: 10/2/17 Note: the information listed here is that of the send and not the laboratory						
Tests Requested: Purity/Noxious All-States, Germination Tests								
Purity analysis A		Viability analysis B						
4.488 g analyzed	%Pure Seed	%normal	%dormant	%hard	%total viable	Seeds tested	Days tested	Date Completed
Pure seed components		Comments: Palmer amaranth identification confirmed by PCR testing on single seeds.						
Partridge Pea <i>Cassia fasciculata</i>	20.71	41	x	54	95	400	12	12/17/2017
Canada Tick Trefoil <i>Desmodium canadense</i>	20.18	36	x	61	97	400	12	12/17/2017
Wild Bergamot <i>Monarda fistulosa</i>	10.05	78	10	x	88	400	10	12/17/2017
Black-eyed Susan <i>Rudbeckia hirtai</i>	25.23	85	8	x	93	400	12	12/17/2017
Hoary Vervain <i>Verbena stricta</i>	21.78	45	35	x	80	400	12	12/17/2017
Other Crop Seed	1.87							
Inert Matter	0.01							
Weed Seed	0.17							
Other Crop Seed		All-States Noxious			Noxious weed seeds in 40.47 grams			
Kind:	No. found	Kind:	No. found	No./lb				
Illinois Bundleflower	4	Palmer Amaranth <i>Amaranthus palmeri</i>	6	11.1				
Purple Prairie Clover	2	Giant foxtail <i>Setaria faberii</i>	10	21.2				
New England Aster	1							
Inert matter		Other determinations:						
Broken seed pieces, plant material, soil		Also found in 40.47 grams: 1 common lamb's quarters, 2 common chickweed						
Common Weed Seed		Rules Followed: AOSA						
Kind:	No. found							
Lamb's Quarters <i>Chenopodium album</i> - 2								

Figure 3. Sample of Palmer Amaranth Test Report

Palmer Amaranth Report							
Customer Name: Best Prairie Seed in Minnesota				Date Received:			
Address:				Date Completed:			
Phone:				Date Reported:			
Sample Number	Customer Sample ID	Seed Number	Lot	Number of Seeds Tested	Plate	Well Location	Results Palmer Amaranth
217236321	1539087	1	BPSIM1802	1	A4211	A1	Negative
217236321	1539087	2	BPSIM1802	1	A4211	A2	Negative
217236321	1539087	3	BPSIM1802	1	A4211	A3	Negative
217236321	1539087	4	BPSIM1802	1	A4211	A4	Negative
217236321	1539087	5	BPSIM1802	1	A4211	A5	Negative
217236321	1539087	6	BPSIM1802	1	A4211	A6	Negative

