Plant Risk Evaluator -- PRE™
Evaluation Report

Brachychiton populneus -- Arizona

2023-2025 Western IPM Project

PRE Score: 11 -- Low Potential Risk
Confidence: 66 / 100
Questions answered: 20 of 20 -- Valid (80% or more questions answered)

Privacy: Public
Status: Completed

Evaluation Date: December 13, 2024

This PDF was created on August 21, 2025

This project was funded in part by the USDA National Institute of Food and Agriculture through the Western Integrated Pest Management Center, grant number 2018-70006-28881.

Plant Evaluated

Brachychiton populneus

Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Brachychiton populneus*) in an effort to understand the invasive history, reproductive strategies, and the impact, if any, on the region's native plants and animals. This research reflects the data available at the time this evaluation was conducted.

Summary

Brachychiton populneus has a history of repeated introductions outside its natural range. This includes regions with a climate match to Arizona. These include southern California, eastern South Africa, northwest Africa, southern Europe, and Western Australia. However, the species has not been documented to have evidence of impact in any of these countries. Brachychiton populneus reproduces by seeds, which are spread by birds and mammals.

General Information

Status: Completed
Screener: Michael Chamberland
Evaluation Date: December 13, 2024

Plant Information

Plant: *Brachychiton populneus*

Regional Information

Region Name: Arizona

Climate Matching Map

To answer four of the PRE questions for a regional evaluation, a climate map with three climate data layers (Precipitation, UN EcoZones, and Plant Hardiness) is needed. These maps were built using a toolkit created in collaboration with GreenInfo Network, USDA, PlantRight, California Invasive Plant Council, and The Information Center for the Environment at UC Davis.

Click here to see the generated climate matching map for this region. This climate match database is hosted by GreenInfo Network and publicly accessible.

Evaluation Questions

These questions are based on an article published by PLOS One, which can be found here: https://doi.org/10.1371/journal.pone.0121053.

Invasive History and Climate Matching (Questions 1 - 6)

1. Has the species (or cultivar or variety, if applicable; applies to subsequent "species" questions) become naturalized where it is not native?

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Brachychiton populneus is native to eastern Australia, from southern inland Queensland and the western slopes of New South Wales, through to eastern Victoria (Australian Native Plants Society, 2024). GBIF (2024) lists Brachychiton populneus as introduced in the USA, Cyprus, Ecuador, France, India, Italy, Libya, South Africa, and Turkey. GBIF (2024) also presents a distribution map which shows multiple occurrences of Brachychiton populneus in additonal sites in Western Australia, New Zealand, northwest Africa, and south-central parts of South America. The species has a history of repeated introductions outside its natural range (HEAR.org, 2012).

Reference(s):

- Plants, A. Native (2024). Brachychiton populneus.
- GBIF (2024). GBIF - Brachychiton populneus.
- HEAR.org (2012). HEAR Brachychiton populneus.

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2. Is the species (or cultivar or variety) noted as being naturalized in the US or world in a similar climate?

- Answer: **Yes**, which contributes **2** point(s) to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Brachychiton populneus occurrs in regions with a climate match to Arizona. These include southern California, eastern South Africa, northwest Africa, southern Europe, and Western Australia (GBIF, 2024).

Reference(s):

- GBIF (2024). GBIF - Brachychiton populneus.

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3. Is the species (or cultivar or variety) noted as being invasive in the U.S. or world?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

GBIF (2024) lists Brachychiton populneus as introduced in the USA, Cyprus, Ecuador, France, India, Italy, Libya, South Africa, and Turkey. However, GBIF (2024) does not note the species as showing evidence of impact in any of these countries.

Reference(s):

- GBIF (2024). GBIF - Brachychiton populneus.

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4. Is the species (or cultivar or variety) noted as being invasive in the US or world in a similar climate?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Brachychiton populneus occurrs in regions with a climate match to Arizona. These include southern California, eastern South Africa, northwest Africa, southern Europe, and Western Australia (GBIF, 2024). However, GBIF (2024) does not note the species as showing evidence of impact in any of these regions.

Reference(s):

- GBIF (2024). GBIF - Brachychiton populneus.

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5. Are other species of the same genus (or closely related genera) invasive in a similar climate?

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Brachychiton is a genus of 30 or more species, most of which occur in tropical parts of Australia in dry areas or in rainforest. They are large shrubs or trees. One of the most commonly cultivated is the Illawarra flame tree (Brachychiton acerifolius) which is popular due to its spectacular crimson flowers. It is native along the east coast of Australia (Australian Native Plants Society (2024). GBIF (2024) indicates Brachychiton acerifolius has evidence of impact where this plant has naturalized in Western Australia (GBIF, 2024), which is also a climate match to Arizona. GBIF (2024) tracks a large number of species of Brachychiton. The others listed include some with naturalization in other parts of the world, but apparently without impact.

Reference(s):

- Plants, A. Native (2024). Brachychiton populneus.
- GBIF (2024). GBIF - Brachychiton populneus.

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6. Is the species (or cultivar or variety) found predominately in a climate matching the region of concern?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **Low** confidence in this answer based on the available literature.

Answer / Justification:

Brachychiton populneus appears to be found predominately in regions with a climate match to Arizona where it is introduced in North America, though elsewhere around the world its association with climate matched areas is less correlated, or uncertain due to its frequency in cultivation. Occurrences mapped by GBIF (2024) which are not climate matches (Kenya, New Zealand, Uruguay) are otherwise not well documented on GBIF or elsewhere.

Reference(s):

- GBIF (2024). GBIF - Brachychiton populneus.

Impact on Native Plants and Animals (Questions 7 - 10)

7. Does this plant displace native plants and dominate (overtop or smother) the plant community in areas where it has established?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

The HEAR (2012) report on Brachychiton populneus rates the species as "no" in the category of climbing or smothering growth habit. It is a small to medium-sized tree which may reach 20 metres in height, although it is often much smaller. It has a compact and densely foliaged habit. The trunk is stout and grey. (Native Plants, 2024).

Reference(s):

- HEAR.org (2012). HEAR Brachychiton populneus.
- Plants, A. Native (2024). Brachychiton populneus.

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8. Is the plant noted as promoting fire and/or changing fire regimes?

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

The HEAR (2012) report on Brachychiton populneus indicates the species creates a fire hazard in natural ecosystems. The Kings Park bushland (invaded by B. populneus) has been frequently burnt, and the results of this study suggest that B. populneus can survive at least one fire by resprouting from basal dormant buds (Buist et al, 2000).

Reference(s):

- HEAR.org (2012). HEAR Brachychiton populneus.
- BUIST, MARCELLE., YATES COLIN. J., & LADD PHILIP. G. (2000). Ecological characteristics of Brachychiton populneus (Sterculiaceae) (kurrajong) in relation to the invasion of urban bushland in south-western Australia. Austral Ecology. 25,

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9. Is the plant a health risk to humans or animals/fish? Has the species been noted as impacting grazing systems?

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **Low** confidence in this answer based on the available literature.

Answer / Justification:

Brachychiton populneus has been noted as causing pollen allergies. It was included in a study of highly-allergenic species in cultivation by Velasco-Jimenez et al, (2020). HEAR.org (2012) compiles accounts which suggest foliage of Brachychiton populneus is palatable, susceptible to browsing, and one of the best fodder trees for cattle and sheep. But also, animals have been poisoned if their diet is almost exclusively of this tree. Seeds may potentially be toxic to livestock. Experimentally the seeds have proved to be toxic. Animals have been poisoned only when their diet consisted almost totally of this tree." (HEAR.org, 2012).

Reference(s):

- Velasco-Jiménez, M. José, Alcázar P., Cariñanos P., & Galán C. (2020). Allergenicity of the urban green areas in the city of Córdoba (Spain). Urban Forestry & Urban Greening. 49, 126600.
- HEAR.org (2012). HEAR Brachychiton populneus.

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10. Does the plant produce impenetrable thickets, blocking or slowing movement of animals, livestock, or humans?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **Very Low** confidence in this answer based on the available literature.

Answer / Justification:

Buist et al (2000) notes that in Kings Park, B. populneus (invasive in the area) was most commonly observed beneath the canopy or close to the trunks of another tree, and in many cases there was clumping of many B. populneus seedlings and saplings around a tree. By inference, the potential for forming thickets may exist. Issues caused by thicket formation are not noted in the literature (HEAR, 2012). Hamad et al, (2023) observed B. populneus germination is highest in full sun and is suppressed by shading. This counts against the formation of thickets by seed reproduction. Brachychiton populneus does not produce spines, thorns, or burrs nor has a climbing or smothering growth habit (HEAR, 2012) which could contribute to impenetribility.

Reference(s):

- BUIST, MARCELLE., YATES COLIN. J., & LADD PHILIP. G. (2000). Ecological characteristics of Brachychiton populneus (Sterculiaceae) (kurrajong) in relation to the invasion of urban bushland in south-western Australia. Austral Ecology. 25,
- HEAR.org (2012). HEAR Brachychiton populneus.
- Hamad, S. O., Mahmood A. H., & Ali N. S. (2023). Germination and Early Growth of Brachychiton populneus (Schott & Endl.) in Response to Different Shade Percentages and Sowing Depths.. ZANCO Journal of Pure and Applied Sciences. 35,

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Reproductive Strategies (Questions 11 - 17)

11. Does this species (or cultivar or variety) reproduce and spread vegetatively?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

The easiest way to propagate a Kurrajong tree is usually from seed. You can choose cuttings from the smaller branches of an established Kurrajong tree in the dry season. Brachychiton populneus is sensitive to the cutting process. Dip the cuttings in rooting hormone and then plant. It takes around 90 days for roots to appear (Clarke, 2024). By inference, it seems unlikely to reproduce and spread vegetatively.

Reference(s):

- Clarke, G. (2024). Aussie Green Thumb - Kurrajong Tree (Brachychiton populneus) Growing Guide.

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12. If naturally detached fragments from this plant are capable of producing new plants, is this a common method of reproduction for the plant?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

In horticulture, Brachychiton populneus is usually propagated by seed, and it is sensitive to the cutting process. Cuttings are advised to be treated with a rooting hormone. It takes around 90 days for roots to appear (Clarke, 2024). By inference, it seems unlikely to reproduce from detatched fragments.

Reference(s):

- Clarke, G. (2024). Aussie Green Thumb - Kurrajong Tree (Brachychiton populneus) Growing Guide.

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13. Does the species (or cultivar or variety) commonly produce viable seed?

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

The HEAR (2012) report on Brachychiton populneus rates the species as producing viable seed. Buist et al, (2000) report an average-sized reproductive tree produces up to 7000 seeds in one flowering event, and observations of flowering in the years before and after the study suggest that large amounts of seed are produced annually. Consequently, although there are only a small number of reproductive trees present to act as foci, prolific annual seed production in these individuals is enough to support an invasion.

Reference(s):

- HEAR.org (2012). HEAR Brachychiton populneus.
- BUIST, MARCELLE., YATES COLIN. J., & LADD PHILIP. G. (2000). Ecological characteristics of Brachychiton populneus (Sterculiaceae) (kurrajong) in relation to the invasion of urban bushland in south-western Australia. Austral Ecology. 25,

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14. Does this plant produce copious viable seeds each year (> 1000)?

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

With an estimate of 8–12 cubic meter of foliage per average-sized reproductive tree, approximately 4736–7104 seeds are produced per tree (Buist et al, 2000).

Reference(s):

- BUIST, MARCELLE., YATES COLIN. J., & LADD PHILIP. G. (2000). Ecological characteristics of Brachychiton populneus (Sterculiaceae) (kurrajong) in relation to the invasion of urban bushland in south-western Australia. Austral Ecology. 25,

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15. Is there significant germination (>25%) of seeds the next growing season, with no requirement of an infrequent environmental condition for seeds to germinate (i.e. fire) or long dormancy period?

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

A study of germination pre-treatments by Kheloufi et al, (2018) found a 0% germination of untreated Brachychiton populneus seeds under laboratory conditions. Treatments with sulfuric acid for 60 minutes produced 100% germination. Germination success was also described for immersion in hot followed by soaking for 12 hours in cooled water. Seeds buried in bags by Buist et al, (2000) saw germination coincided with the onset of the winter rains and continued into winter so that by August when the seeds had been buried for 6 months 98% had germinated. Seeds that had not germinated in the shorter burial periods were found to have high rates of viability. In this study 98% of the seed that was buried in late summer (March) had germinated within 6 months; germination began with the onset of winter rains and continued throughout the wet winter months. While these two studies were contradictory, the relevant evidence is from the field studies by Buist et al, (2000).

Reference(s):

- Kheloufi, A., Mansouri L., Aziz N., Sahnoune M., Boukemiche S., & Ababsa B. (2018). Breaking seed coat dormancy of six tree species. REFORESTA. 4–14.
- BUIST, MARCELLE., YATES COLIN. J., & LADD PHILIP. G. (2000). Ecological characteristics of Brachychiton populneus (Sterculiaceae) (kurrajong) in relation to the invasion of urban bushland in south-western Australia. Austral Ecology. 25,

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16. Does this plant produce viable seed within the first three years (for an herbaceous species) to five years (for a woody species) after germination?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

The HEAR (2012) report on Brachychiton populneus cites a report that time to first flowering is possibly 8+ years. Since this is a large-stature tree with large fruits, by inference this supports the likelihood of over five years required.

Reference(s):

- HEAR.org (2012). HEAR Brachychiton populneus.

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17. Does this plant continuously produce seed for >3 months each year or does seed production occur more than once a year?

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **Low** confidence in this answer based on the available literature.

Answer / Justification:

Flowering time: April - June (in Malta, where introduced) (Mifsud, 2002).

Reference(s):

- Mifsud, S. (2002). Brachychiton populneus (Kurrajong) : MaltaWildPlants.com - the online Flora of the Maltese Islands..

Dispersal (Questions 18 - 20)

18. Are the plant's propagules frequently dispersed long distance (>100 m) by mammals or birds or via domestic animals?

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Australian ravens were observed on several occasions in flight carrying B. populneus fruit or perched in trees with B. populneus fruit in their beaks. It is possible that ravens, perched in trees feeding on transported fruit, do not consume all the seed, and some seed falls to the ground. The foraging behaviour of black rats may also be responsible for establishment patterns, with caches of eaten and uneaten fruit and seeds observed near the base of trees. The foraging behaviour of the vertebrates may facilitate the dispersal of seeds for relatively long distances away from parent plants (Buist et al, 2000).

Reference(s):

- BUIST, MARCELLE., YATES COLIN. J., & LADD PHILIP. G. (2000). Ecological characteristics of Brachychiton populneus (Sterculiaceae) (kurrajong) in relation to the invasion of urban bushland in south-western Australia. Austral Ecology. 25,

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19. Are the plant's propagules frequently dispersed long distance (>100 m) by wind or water?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

The HEAR (2012) report on Brachychiton populneus cites "Dispersal: Birds, rats and possibly other mammals." [no evidence of water dispersal]. The tree is not reported to occurr preferentially along waterways.

Reference(s):

- HEAR.org (2012). HEAR Brachychiton populneus.

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20. Are the plant's propagules frequently dispersed via contaminated seed (agriculture or wildflower packets), equipment, vehicles, boats or clothing/shoes?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

The HEAR (2012) report on Brachychiton populneus categorizes the propagules as unlilely to disperse as a produce contaminant. The fruits and seeds of B. populneus are quite large and unlikly to be disperesed inadvertantly.

Reference(s):

- HEAR.org (2012). HEAR Brachychiton populneus.

Total PRE Score

PRE Score: 11 -- Low Potential Risk
Confidence: 66 / 100
Questions answered: 20 of 20 -- Valid (80% or more questions answered)

PRE Score Legend

The PRE Score is calculated by adding the point totals for each (answered) question.
< 13 : Low Potential Risk
13 - 15 : Moderate Potential Risk
> 15 : High Potential Risk

Questions Answered Legend

It is important to answer at least 16 questions to consider a PRE Score as "valid".
>= 16 : valid (80% or more questions answered)
<= 15 : invalid (not enough questions answered)

Organization Ownership and Content Privacy

Organization: 2023-2025 Western IPM Project
Content Privacy: Public

Evaluation Reviewers

The PRE approach is to base decisions on science and make decisions by consensus of diverse horticultural stakeholders. The literature review and process of answering PRE's questions are based on science; the decisions of which plants to prioritize are based on consensus. To ensure this process is in place and that PRE is collaborative, volunteer stakeholders are recruited from each region to review evaluations. The following experts in their profession (plant science, conservation, or horticultural trade) have participated as volunteer PRE reviewers for this evaluation:

• Jutta Burger	February 4, 2025
• Nicole Valentine	January 10, 2025

This evaluation has a total of 2 reviewer(s).

Evaluation Issues

The following section lists all public issues for this evaluation. Issues provide a way for stakeholder reviewers to communicate any concerns or suggestions they might have with the plant or evaluation. Please email info@plantright.org if additional action is required to resolve open issues.

Issue ID # 10736

Date Created: February 4, 2025 - 10:36am
Date Updated: March 10, 2025 - 2:38pm

Submitted by: Jutta Burger

Status: Fixed
Type: Suggestion
Severity: Major
Scope: Q10. Does the plant produce impenetrable thickets, blocking or slowing movement of animals, livestock, or humans?

Issue Description

Not sure this justification warrants a "yes", since there's no evidence really for it. - You may also want to mention that it does not have spines or thorns (correct?). - JB

(reference to Q10 added later)

Issue Resolution (Screener's Response to Issue)

I suspect this is in regards to question 10. I have made some adjustments to the answer. - M. Chamberland

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Issue ID # 10735

Date Created: February 4, 2025 - 10:24am
Date Updated: March 4, 2025 - 7:32pm

Submitted by: Jutta Burger

Status: Fixed
Type: Suggestion
Severity: Minor
Scope: Q06. Is the species found predominately in a climate matching the region of concern?

Issue Description

In looking at the climate match map, I would probably opt for a 'no' on this, but I can see where you might select 'yes' (if you doubt some of the other locations shown). If you stick with a "yes", you may want to mention that the core of its native range is *not* in matching climate. - JB

Issue Resolution (Screener's Response to Issue)

I have taken this into consideration and adjusted. - M. Chamberland

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Issue ID # 10734

Date Created: February 4, 2025 - 9:57am
Date Updated: March 4, 2025 - 7:32pm

Submitted by: Jutta Burger

Status: Fixed
Type: Suggestion
Severity: Minor
Scope: Regional Information

Issue Description

Please attach climate match map and link. - JB

Issue Resolution (Screener's Response to Issue)

Done. - M. Chamberland

Issue ID # 10688

Date Created: January 10, 2025 - 4:49pm
Date Updated: March 4, 2025 - 7:35pm

Submitted by: Nicole Valentine

Status: Fixed
Type: Suggestion
Severity: Minor
Scope: Q17. Does this plant continuously produce seed for >3 months each year or does seed production occur more than once a year?

Issue Description

Does that count as more than three months? -NV

Issue Resolution (Screener's Response to Issue)

Yes, the help FAQ for this question states: For this question to be answered yes, the plant would need to: 1) continuously produce seed for GREATER THAN 3 months; 2) produce flowers for 3 months OR LONGER. The reference reports flowering for three months. - M. Chamberland

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Issue ID # 10687

Date Created: January 10, 2025 - 4:47pm
Date Updated: March 4, 2025 - 7:41pm

Submitted by: Nicole Valentine

Status: Fixed
Type: Suggestion
Severity: Minor
Scope: Q07. Does this plant displace native plants and dominate the plant community in areas where it has been established?

Issue Description

Would be good to briefly describe its growth form here and could be useful in the plant summary too.
-NV

Issue Resolution (Screener's Response to Issue)

Done. - M. Chamberland

About PRE and this Plant Evaluation Report

The Plant Risk Evaluator (PRE) is an online database and platform designed to assess the risk of a plant becoming invasive in a given region.This tool offers many benefits, and we encourage you to visit the PRE website (https://pretool.org) for more information.

If you would like to learn more about PRE, please email us at info@plantright.org, requesting a PRE Account.

PRE beta funding was provided by Sustainable Conservation (https://www.suscon.org/) and a USDA Farm Bill grant. Additional funding has been provided by the Western Integrated Pest Management Center.