

This form shall be completed to determine a pest rating and all applicable sections with known information shall be completed:

CALIFORNIA PEST RATING PROPOSAL

Gryllus locorojo Weissman & Gray, 2012 (Crazy Red Field Cricket)

Current Rating: none

Proposed Rating: "A"

Initiating Event: Identify the organism considered for the pest rating and the event(s) that triggered this pest rating proposal. In the 12 years since this species was described, no new information has developed about its country of origin or biology. It is also unknown if this cricket is currently being raised and distributed by any USA or CA commercial cricket farms, since there is no active regulatory surveillance. The situation in Europe and western Asia is also unknown but this species was actively being raised, and distributed, there in 2011. Most disturbingly, new evidence (Giusti *et al.* 2024) documents the unauthorized presence of *G. locorojo* DNA in European Union insect-based food products produced for human consumption. Since this non-native USA cricket can only be identified by a few experts, and requires live singing adult males and DNA, its identification is problematic. Therefore, in the interest of caution, it should be banned from importation into California and movement with the state.

History & Status:

Background: Describe what is known about the biology of the pest, its host range, and potential pathways and spread. Nothing known about natural origin and biology. It would most probably be spread as either an accidental escape or from a purposeful release.

Worldwide Distribution: Identify the native range of the pest. Also identify other countries and states that it has invaded. Native range unknown. In 2012, it was being commercially raised and shipped worldwide from several sources in CA, Europe, and western Asia

Official Control: Is the pest under official control in any countries or states? Unknown but doubtful

California Distribution: Identify where the pest has been found in the environment of California. Commercial cricket farms

California Interceptions: Identify where the pest has been found in regulatory situations in California (e.g., at the airports, border stations, nurseries, ports, seed receivers, etc.). Unknown

The risk Crazy Red Field Cricket would pose to California is evaluated below.

Consequences of Introduction:

- 1) Climate/Host Interaction: Evaluate if the pest would have suitable hosts and climate to establish in California. **Score: 2**
 - **Low (1)** Not likely to establish in California; or likely to establish in very limited areas.
 - **Medium (2)** may be able to establish in a larger but limited part of California.
 - **High (3)** likely to establish a widespread distribution in California.

- 2) Known Pest Host Range: Evaluate the host range of the pest. **Score: Q**
 - **Low (1)** has a very limited host range.
 - **Medium (2)** has a moderate host range.
 - **High (3)** has a wide host range.

- 3) Pest Dispersal Potential: Evaluate the natural and artificial dispersal potential of the pest. **Score: 2**
 - **Low (1)** does not have high reproductive or dispersal potential.
 - **Medium (2)** has either high reproductive or dispersal potential.
 - **High (3)** has both high reproduction and dispersal potential.

- 4) Economic Impact: Evaluate the likely economic impacts of the pest to California using the criteria below. **Score: 2**
 - A. The pest could lower crop yield.
 - B. The pest could lower crop value (includes increasing crop production costs).
 - C. The pest could trigger the loss of markets (includes quarantines).
 - D. The pest could negatively change normal cultural practices.
 - E. The pest can vector, or is vectored, by another pestiferous organism.
 - F. The organism is injurious or poisonous to agriculturally important animals.
 - G. The organism can interfere with the delivery or supply of water for agricultural uses.
 - **Low (1)** causes 0 or 1 of these impacts.
 - **Medium (2)** causes 2 of these impacts.
 - **High (3)** causes 3 or more of these impacts.

- 5) Environmental Impact: Evaluate the environmental impact of the pest on California using the criteria below.
 - A. The pest could have a significant environmental impact such as lowering biodiversity, disrupting natural communities, or changing ecosystem processes.
 - B. The pest could directly affect threatened or endangered species.
 - C. The pest could impact threatened or endangered species by disrupting critical habitats.
 - D. The pest could trigger additional official or private treatment programs.
 - E. The pest significantly impacts cultural practices, home/urban gardening or ornamental plantings.

Score the pest for Environmental Impact. **Score: 3**

- **Low (1)** causes none of the above to occur.
- **Medium (2)** causes one of the above to occur.
- **High (3)** causes two or more of the above to occur.

Consequences of Introduction to California for Crazy Red Field Cricket: Unknown, which is why it should be regulated before we find out.

Add up the total score and include it here. **(Score) 9**

- **Low** = 5-8 points
- **Medium** = 9-12 points
- **High** = 13-15 points

6) Post Entry Distribution and Survey Information: Evaluate the known distribution in California. Only official records identified by a taxonomic expert and supported by voucher specimens deposited in natural history collections should be considered. Pest incursions that have been eradicated, are under eradication, or have been delimited with no further detections should not be included. **(Score) Probably 1. In 2012, only known from commercial cricket farms. Present status unknown**

- **Not established (0)** Pest never detected in California, or known only from incursions.
- **Low (-1)** Pest has a localized distribution in California, or is established in one suitable climate/host area (region).
- **Medium (-2)** Pest is widespread in California but not fully established in the endangered area, or pest established in two contiguous suitable climate/host areas.
- **High (-3)** Pest has fully established in the endangered area, or pest is reported in more than two contiguous or non-contiguous suitable climate/host areas.

7) The final score is the consequences of introduction score minus the post entry distribution and survey information score: **(Score) 8**

Uncertainty: It is important to separate out uncertainty from risk. Use this section to evaluate any uncertainty associated with the introduction of the pest to California. **Everything about this cricket is uncertain: where it comes from, what is its potential pest status to CA agriculture, what risks it might pose to native CA *Gryllus* species, etc.** Complicating this situation is the fact that accurate identification of this taxon would require the calling songs of live adult males probably combined with genetic confirmation. Outside of this petitioner and Dr. David Gray, I am unsure of who else in CA (or the USA) could reliably ID specimens. It simply makes sense to be pro-active in this situation since there is no necessity for the importation or movement of this species in CA, since commercial cricket farms appear to be doing well with non-native *Acheta domesticus* and *Gryllodes sigillatus*. These latter two taxa are already widespread adventives throughout the USA and much of the world.

Include anything that may cause it to be a greater or lesser pest here than in other places.

Conclusion and Rating Justification: Draw conclusions of the risk associated with this pest to California using all of the evidence presented above. Propose a pest rating. **I would give this an “A” rating given the fact that there are already 12 native *Gryllus* species in CA.**

References: List references used here. Include links to online information wherever possible.

Giusti, A., Spatola, G., Mancini, S., Nuvoloni, R. & Armani, A. (2024) Novel foods, old issues: Metabarcoding revealed mislabeling in insect-based products sold by e-commerce on the EU market. *Food Research International*, 184, 114268. <https://doi.org/10.1016/j.foodres.2024.114268>.

Gray, D.A., Weissman, D.B., Cole, J.A., Lemmon, E.M. & Lemmon, A.R. (2020) Multilocus phylogeny of *Gryllus* field crickets (Orthoptera: Gryllidae: Gryllinae) utilizing anchored hybrid enrichment. *Zootaxa* 4750 (3): 328-348. <https://doi.org/10.11646/zootaxa.4750.3.2>

Weissman, D.B., Rentz, D.C. 1977. Feral *Acheta domesticus* in Southern California. *Ent. News* 88: 246-248.

Weissman, D.B., Walker, T.J., Gray, D.A. 2009. The field cricket *Gryllus assimilis* and two new sister species (Orthoptera: Gryllidae). *Annals of the Entomological Society of America* 102: 367-380. <https://doi.org/10.1603/008.102.0304>

Weissman, D. B., Gray, D. A., Pham, H. T., Tijssen, P. 2012. Billions and billions sold: pet-feeder crickets (Orthoptera: Gryllidae), commercial cricket farms, an epizootic densovirus, and government regulations make for a potential disaster. *Zootaxa* 3504: 67-88. <https://doi.org/10.11646/zootaxa.3504.1.3>

Weissman, D. B. & Gray, D. A. (2019) Crickets of the genus *Gryllus* in the United States (Orthoptera: Gryllidae: Gryllinae). *Zootaxa* 4705 (1): 001-277. <https://doi.org/10.11646/zootaxa.4705.1.1>

Responsible Party: Name, address, telephone number and email address of the rater.

David B. Weissman, PhD, Department of Entomology, California Academy of Sciences, 15431 Francis Oaks Way, Los Gatos, CA, 95032. (408) 358-3556. Email: Gryllus@gmail.com