

## WEED-INITIATED PEST RISK ASSESSMENT FOR: FNW-TRIDAX PROCUMBENS L.

This pest risk assessment by: William J. Graves, Area Identifier, Plant Pathology/Botany, USDA, APHIS, PPQ, Laredo, Texas, 06/21, 2000.

STAGE I: Initiating Pest Risk Analysis Process:

STEP I: Document the Initiating Event for the Pest Risk Assessment:

A. This Pest Risk Assessment is for the purpose of determining if this species should remain listed as a noxious weed, or delisted, due to its presence in the southeastern states of the United States.

B. An infestation of *Tridax procumbens* L., was found in Laredo, Texas, on December 02, 1998, at Bruni warehouse, Mines road, Laredo, Texas. The infestation consisted of about 1000 full blooming plants in an area approximately 18 feet wide and 100 feet long on either side of a railroad spur. The infestation must have started from seeds dropped from coffee sacks from Mexico, being unloaded from a railcar to the warehouse. After 18 months of treatment as of June 16, 2000, this infestation no longer exists. This pest risk assessment will also concern future control of infestations that might occur in localities where this plant does not grow.

STEP II: Identify and Cite Previous Risk Assessments:

*Tridax procumbens* was listed in the regulations as a federal noxious weed in 1983, based on the recommendations of the Technical Committee to Evaluate Noxious Weeds (TCENW). TCENW was composed of representatives from the Agricultural Research Service, The Animal and Plant Health Inspection Service, The Agricultural Marketing Service, and The Weed Science Society of America. This committee recommended for listing serious weeds of other countries, if the weeds were either absent from the United States, or of limited distribution. Weed risk assessment in the early 1980's consisted of checking world weed references for the most serious weeds, and then determining distribution in the United States. The TCENW did not propose for listing agriculturally useful taxa unless they posed dangerous weedy tendencies. (Gunn and Richie, 1982).

STEP III: Establish Identity of Weed:

### **TAXONOMY:** (After Bessey)

**Division:** Spermatophyta

**Subdivision:** Angiospermae

**Class:** Dicotyledoneae

**Subclass:** Cotyloideae

**Order:** Asterales

**Family:** Asteraceae

**Common Name:** Coatbuttons, Railway Weed.

**Botanical Name:** *Tridax procumbens* L.

Weed biology: Separation from other species of the genera *Tridax*:

1. Disk corollas 3mm long or more.

2. Marginal flowers pistillate, without anthers, their corollas usually with evident broad ligules, and 2 minute inner lobes.
3. Involucre of few nearly equal phyllaries, these copiously hirsute, at least the outer ones green and leafy in texture.
4. Phyllaries flat or convex on the backs: disk-achenes densely appressed pubescent or hairy: pappus (2) 3-5 (-7.5) mm long: ligules white to pale yellow.
5. Perennials, often trailing and rooting at the nodes with the tips ascending, the heads mostly solitary and terminal: hairs of the peduncles tending to be retrorsely appressed: disk-flowers 30 or more.
6. Achenes long-pilose, tapering to the base: disk-flowers 50-70 or more; herbage green or yellowish green: involucre 6-8 mm long, the outer phyllaries 2-4 mm wide. (The number of disc-flowers, color of herbage, and width of the outer phyllaries distinguish *Tridax procumbens* from *Tridax mexicana*.) (Powell, 1965).

*Tridax procumbens* is native to Central America, where it is a principal weed, and a common weed in 10 countries, and unranked in 25 other countries. (Holm et al.,1979). It is a serious weed in cotton, and a principal weed in corn, sugarcane, sorghum, soybeans, and wheat.

#### STAGE II: ASSESSING PEST RISK:

##### STEP 4: Verify Quarantine Pest Status:

###### Regulatory and Geographic Criteria:

Regulatory: *Tridax procumbens* is listed as a Federal Noxious Weed, so importation and interstate movement are prohibited except under permit. The basis for its listing was: competes with and reduces yields of rotation crops, perennial crops, and pastures. (Federal Register, Final Rule, published 5/4/83, effective 6/3/83). *Tridax procumbens* has been listed as a serious weed in Ghana, Ivory Coast, Mozambique, New Guinea, and Thailand; as a principal weed in El Salvador, Guatemala, Honduras, Indonesia, Nigeria, and Tanzania. (Holm et al. 1979). *Tridax procumbens* is present in a small area in Laredo, Texas, Brownsville, Texas, and much of the state of Florida. Efforts to destroy the infestation in Laredo, Texas, by USDA, PPO, with Round-up Pro, have been successful, and it is nearly eradicated. In Brownsville, Texas, the Railroad people have treated the infestation, but at this time the results are not known. The State of Florida, the Bureau of Invasive Plant Management has been attempting to regulate the plant, and is experiencing some success.

Geographic: *Tridax procumbens* is in many countries, it is known to occur throughout Mexico, West Indies; Guatemala to South America ; introduced in Florida, India, and Mauritius. (Standley, 1930). We know the infestations in Laredo and Brownsville occurred when coffee railcars, that loaded in Toluca, Mexico, (west of Mexico City), were infested by seeds that hitchhiked to these two ports. Both infestations are on railroad lines, where coffee cars traveled. We feel that *Tridax procumbens* has not reached the limits of its ecological range, as in Laredo it has continued to grow and flower at all times of the year, even in below freezing temperatures.

##### STEP 5: Assess Economic and Environmental Importance: Consequences of Introduction:

###### RE# 1: Habitat Suitability:

*Tridax procumbens* rates High, with a numerical score of 3, as it is fairly cold hardy into possibly four plant hardiness zones, is capable in Laredo of growing in rocky soil from seed to a blooming plant in 10 days, with each achene capable of producing 500-1500 seeds. ( Experience:William J. Graves, 1998-1999).

RE# 2: Agricultural Damage Potential:

*Tridax procumbens* is known to be a serious weed of cotton, and a principal weed in cassava, corn, pastures, sugarcane, sorghum, soybeans, and wheat. (Holm 1979). From watching the infestation in Laredo for the past year, it spreads into buffel grass very well and chokes the grass out. Because of this feature, I would rate the plant High with a numerical score of 3.

RE# 3: Dispersal Potential:

*Tridax procumbens* is an extremely fast growing plant. I have watched the plants in Laredo grow from a two leaf seedling to a 12" tall 12" wide plant in full bloom within three weeks, and begin to bloom within ten days. The ease with which the plant spreads itself is due to the large number of achenes produced (500-1500 /plant, which are capable of being carried by the wind and thus dispersed over extensive areas. (Tadulingam and Venkatanarayana, 1955). For these reasons, I would have to rate it High, with a numerical score of 3.

RE# 4: Economic Impact:

Reduced crop yield by competition, increased cost of production because of cost of control. Rating Medium with a numerical score of 2.

RE# 5: Environmental Impact:

*Tridax procumbens* will affect native populations as proven in Florida. Large infestations can affect hydrology and nutrient regimes. Toxic Chemical control would be necessary to prohibit spread, as we have been able to control it with glyphosate, (Round-up Pro), but if spreading into wetland crops around Houston, Texas, this treatment would probably be un-wanted, or unavailable.

Rating High, with a numerical score of 3.

ECONOMIC AND ENVIRONMENTAL IMPORTANCE SUMMARY:

Risk: Consequences of Introduction:

High, with a numerical score of 14.

STEP 6: Assess Likelihood of Introduction/Spread:

RE# 6: Entry Potential: Number of Potential Pathways and Likelihood of Survival

In Each: A. Railcars: *Tridax procumbens* can easily survive shipment from some eight hundred miles from south Mexico, as we have found out. It is hard to detect at the port of entry due to small size seeds. Can be blown off of railcars anywhere along their route. Can grow very well in good soil or railroad rocks along the tracks.

B. Auto and Cargo vehicles:

Hitchhiking small seed can be transported and dispersed as on railcars.

C. With commodities: As with our experience with coffee railcars, can hitchhike on the coffee sacks until unloading, then dispersed to soil. About two years ago, we had a railcar of coffee, that an officer discovered *Tridax* inside the door, and on many sacks of the coffee inside. Nineteen hours of reimbursable overtime was spent resacking the coffee inside the car, and returning the railcar and sacks back to Mexico. We have also found it in sesame seeds and birdseed mixes.

Pathway	Survive treatment	Survive shipment	Not Be detected	Environment suitable for survival	Find host/Path growing substrate	total
A.	5	5	4	5	5	24
B.	5	5	4	5	5	24
C.	5	5	4	5	5	24
Total across pathways						72

Cumulative pathway score 72 or High.

STEP 7: Conclusion/Pest Risk Potential: Consequences of Introduction, and Likelihood of Introduction risk, High, with a numerical score of 6.

Managing Pest Risk:

- A. Expand methods of detection at ports of entry, by training of officers and technicians, to be capable of identifying the pest.
- B. Develop survey methods of detection of infestations, concentrating along known pathways, Rail, Truck, and Earth Moving Equipment.
- C. Treat infestations with Glyphosate, when at a young stage, or treat blooming infestations with Dicamba or Triclopyr, to sterilize the seeds.

STEP 8: Document the PRA:

A. Databases: USDA, Invasive Plant Species.

The Plant List of Accepted Nomenclature, Taxonomy, and Symbols Plants Database.

B. Publications:

Bessey, C.E., 1915, Principles and Practices of Plant Taxonomy, pages 127-130.

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Holm, L., Pancho, J.V., Herberger, J.P., Plucknett, D.L., 1979, A Geographical Atlas of World Weeds, Page 367.

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Powell, A. Michael, Taxonomy of *Tridax*. *Brittonia* 17:47-96. 1965,

McVaugh, Rogers, *Flora Novo Galiciana*, Vol. 12, Pages 948-949.

Reed, C.F. 1977. Economically Important Foreign Weeds, Page 671.

Standley, P.C., *Trees and Shrubs of Mexico*, 1924, Vol. 23, Page 1597.

Tadulingam, C. and Venkatanarayana, G., 1955, A Handbook of some South Indian Weeds, Government Press, Madras.