Importation of Salicornia tips, *Salicornia bigelovii* from Mexico into the United States

Qualitative, Pathway-Initiated Pest Risk Assessment

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A. Introduction

This pest risk assessment was prepared by the Animal and Plant Health Inspection Service (APHIS) of the U.S. Department of Agriculture (USDA) to examine plant pest risks associated with the importation into the United States of **fresh Salicornia tips (*Salicornia bigelovii*) grown in Mexico**. Much of this report was derived from a pest risk assessment for *Salicornia bigelovii* that was developed by the Bush *et al.,* 1997. This is a qualitative pest risk assessment, that is, estimates of risk are expressed in qualitative terms such as high or low rather than numerical terms such as probabilities or frequencies. The details of methodology and rating criteria can be found in: ***Pathway-Initiated Pest Risk Assessment: Guidelines for Qualitative Assessments, version 4.0*** (USDA, 1995); available from the individual named in the proposed regulations, or on the web site: www.aphis.usda.gov/ppq/bats/bant.

International plant protection organizations, *e.g.*, North American Plant Protection Organization (NAPPO) and International Plant Protection Convention (IPPC) of the United Nations Food and Agriculture Organization (FAO), provide guidance for conducting pest risk analyses. The methods used to initiate, conduct, and report this plant pest risk assessment are consistent with guidelines provided by NAPPO, IPPC and FAO. The use of biological and phytosanitary terms conforms with the *NAPPO Compendium of Phytosanitary Terms* (Hopper, 1996) and the *Definitions and Abbreviations* (Introduction Section) in *International Standards for Phytosanitary Measures, Section 1—Import Regulations: Guidelines for Pest Risk Analysis* (FAO 1996).

The *Guidelines for Pest Risk Analysis* provided by FAO (1996) describe three stages in pest risk analysis. This document satisfies the requirements of FAO Stages 1 (initiation) and 2 (risk assessment).

B. Risk Assessment

1. Initiating Event: Proposed Action

This commodity-based, "pathway-initiated" pest risk assessment is in response to a request for USDA authorization to allow importation of a particular commodity presenting a potential plant pest risk. In this case, the importation of **fresh Salicornia tips (*Salicornia bigelovii*) grown in Mexico** is a potential pathway for introduction of plant pests. Regulatory authority for the importation of fruits and vegetables from foreign sources into the U.S. is found in 7 CFR §319.56 .

Salicornia is a member of the Chenopodiaceae or Goosefoot family. Members of the Chenopodiaceae represent approximately 4% of the more than 6000 species of halophytes (Redouane 1995 and Waisel 1972). *Salicornia bigelovii* is an obligate halophyte which requires salt water for it to complete its life cycle. *Salicornia* is hand harvested when the plants have reached 15 to 18 centimeters. The tips are cut three to five centimeters above the soil surface. They are harvested in handful size bundles of approximately 4-5 ounces and bound. Bundles are placed upright in shipping boxes, with approximately 12 bundles per box. Fresh Salicornia tips from Mexico have been approved for entry into Canada by the Canadian Food Inspection Agency.

2. Assessment of Weediness Potential of Salicornia, *Salicornia bigelovii*

The results of the weediness screening (Table 1) did not prompt a pest-initiated risk assessment.

Table 1: Process for Determining Weediness Potential of Commodity

Commodity: Fresh *Salicornia bigelovii (*Vegetable Tips - "Samphire")

Phase 1: Nine species of Salicornia are native to the United States. *S. bigelovii* is indigenous to coastal salt marshes along the Gulf of California, Gulf of Mexico, Atlantic Ocean and Pacific Ocean. It has been introduced to the San Joaquin Valley of California for a research project that evaluates the plant's ability to grow on conventional agricultural tail waters and, in a different program in California, the plants ability to stabilize fugitive dust on a dry playa.

Phase 2: Is the species listed in:

NO*	*Geographical Atlas of World Weeds* (Holm *et al.*, 1979)
NO	*World's Worst Weeds* (Holm *et al.*, 1977)
NO	*Report of the Technical Committee to Evaluate Noxious Weeds; Exotic Weeds for Federal Noxious Weed Act* (Gunn and Ritchie, 1982)
NO	*Economically Important Foreign Weeds* (Reed, 1977)
NO	Weed Science Society of America list (WSSA, 1989)
NO	Is there any literature reference indicating weediness (*e.g.*, *AGRICOLA*, *CAB*, *Biological Abstracts*, *AGRIS*; search on "species name" combined with "weed").

Phase 3: Conclusion: Because *Salicornia bigelovii* is widely prevalent within the United States, and because the *bigelovii* species was not listed in the literature as a plant with weediness potential, we proceeded with the Pest Risk Assessment.

*Holm (1979) *Salicornia quinqueflora,* is considered a common weed in Australia.

3. Previous Risk Assessments and Current Status

3a. Decision history *Salicornia bigelovii*

Although there are no previous USDA pest risk assessments on *Salicornia bigelovii* from Mexico, USDA records note commercial shipments of *Salicornia* sp. primarily from France (Harabin 1996).

4. Pest List: Pests Associated with *Salicornia* spp.

The pest list in Table 2 was developed after a review of the information sources listed in USDA (1995). The list summarizes information on the distribution of each pest, pest-commodity association, and regulatory history.

Table 2: Pest List

Scientific Name, Classification	Distribution[1]	Comments[2]	References
Pathogens			
Fusarium sp. (Fungi Imperfecti: Hyphomycetes)	MX	a	Bush, 1996
Macrophominia phaseolina (Tassi) Goid. (Fungi Imperfecti: Coelomycetes)	MX,US	a,o	Farr *et al.*, 1989; Stanghellini *et al.*, 1992; Stanghellini *et al.*, 1990.
Pythium sp. (Oomycetes: Peronosporales)	MX	a	Kronland, 1997
Rhizoctonia solani Kuhn (Mycelia Sterilia: Agonomycetes)	MX,US	a,m	Bush, 1996
Bacteria			
Bacillus subtilis (Ehrenberg) Cohn	MX,US	b,o	Bradbury, 1986; Stanghellini and Rasmussen, 1987
Viruses			
Beet Curly Top Virus (Geminivirus)	MX,US	o	Brown, 1996; Brunt *et al.*, 1996
Arthropods			
Alydidae sp. (Hemiptera)	MX	a	Langston, 1997
Chionodes new sp. (sistrella complex) (Lepidoptera: Gelechiidae)	MX	a,e	Lacey, 1988
Cixiidae sp. of (Homoptera)	MX	a	Langston, 1996
Corticarina eichlini Andrews (Coleoptera: Lathridiidae)	US(CA)	o	Andrews, 1992
Gelechiidae sp. (Lepidoptera)	MX	a,e	Watson, 1988

Megalopsallus nuperus Van Duzee (Heteroptera: Miridae)	MX,US	o	Carvalho, 1958; Schwartz, 1997
Metachroma sp. (poss. *M. regulare*) (Coleoptera: Chrysomalidae)	MX	a	Stanghellini *et al.*, 1988
Puto ambiguus (Fullaway) (Homoptera: Pseudococcidae)	MX,US(CA)	m,o	Williams and de Willink, 1992
Pyralidae sp. (Lepidoptera)	MX	a,e	Langston, 1996
Weeds			
Cuscuta salina Engelm. var. *major* Yunck.	MX,US	k,o	Pennings and Callaway, 1996

[1] Distribution legend: MX = Mexico; US = United States; CA = California

[2] Comments:
- a = Pest mainly associated with a plant part other than the commodity.
- b = Not likely to be a primary plant pest.
- e = Although pest attacks commodity, it would not be expected to remain with the commodity during processing.
- k = Not specifically listed for host, but reported from other hosts in same plant genus/family.
- m = The pest occurs within the country of export and has been reported to attack the specified host species in other geographic regions; but has not been reported to attack the specified host species in the country of export.
- o = Organism does not meet the geographic or regulatory definition of a quarantine pest.

5. List of Quarantine Pests

Our list of quarantine pests for commercial shipments of *Salicornia bigelovii* from Mexico is provided in Table 3. Should any of these pests be intercepted on commercial (or any other) shipments of *Salicornia bigelovii*, quarantine action may be taken.

Table 3: Quarantine Pests:

Fusarium sp.
Pythium sp.
Alydidae sp.
Chionodes new sp. (sistrella complex)
Cixiidae sp
Gelechiidae sp. of
Metachroma sp.
Pyralidae sp.

6. Quarantine Pests Likely to Follow Pathway (i.e., Quarantine Pests Selected for Further Analysis

A description of the criteria that pests must satisfy to be considered for further analysis can be found in USDA (1995). Only those quarantine pests that can reasonably be expected to move with Salicornia tips are analyzed in detail. None of these pests are likely to move with Salicornia; hence, this pest risk assessment ends here.

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