LAYERING: A “NEW” MODE OF SPREAD IN ARUNDO DONAX

John M. Boland, Ph.D.

Tijuana River Valley Invasive Plant Control Program
Southwest Wetlands Interpretative Association (SWIA)
GIANT REED -- *Arundo donax*
Arundo lit.: “spreads quickly once established”
Boland 2003: “How?”
CONVENTIONAL WISDOM

SEEDS

FRAGMENTS

RHIZOMES
A LAYER IS:

“A NORMAL SHOOT THAT ROOTS ADVENTITIOUSLY WHEN IN CONTACT WITH THE SOIL”
Ground Layering

Pebble keeps notch open; roots are more likely to form near wound.

Sever rooted layer carefully; roots are tender, easily torn.
Arundo Literature

• Almost nothing about layers & layering


• Review paper by Dudley (2000) says it happens: “root formation does occur where an attached culm has fallen over and is in contact with substrate” but that’s all
HOW COMMON? (Aug 2005)

INSIDE FLOOD ZONE (n = 100):
79% of clumps had >4 new layers

OUTSIDE FLOOD ZONE (n = 100):
0%
2005 – 80 new layers (0.5 yr old) at my 19 monitored clumps
2006 – How do 1.5 year-old layers look?
-- 85% survivorship of layers
NEW VIEW OF SPREAD IN ARUNDO (QUALITATIVE)
QUANTIFY?

RHIZOMES v. LAYERS

FRAGMENTS v. LAYERS
RHIZOMES
2003: STARTED MONITORING EXPANSION
OF 19 CLUMPS
14E in 2005
LAYERS – at edge of Arundo canopy > 3 m
EXPANSION: RHIZOMES v. LAYERS

Expansion of clump edge (m per 2 years)

- Rhizomes: 0.45 m
- Layers: 3.31 m
REPRODUCTION: FRAGMENTS v. LAYERS
SEARCH FOR NEW RECRUITS FROM FRAGMENTS AND LAYERS
(8 BELT TRANSECTS – JUNE 2005)
REPRODUCTION: FRAGMENTS v. LAYERS
(8,374 m² survey)

<table>
<thead>
<tr>
<th>number of new recruits in survey</th>
<th>fragments</th>
<th>layers</th>
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<tbody>
<tr>
<td>0-10</td>
<td>4</td>
<td>99</td>
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OBSERVED IN TIJUANA RIVER VALLEY FLOOD ZONE

1,500 m²
SO WHAT?
"TOP-DOWN" CONTROL STRATEGY SHOULD BE RECONSIDERED

- Assumes:
  - new clumps from fragments only
  - fragments are common

- Counter-productive if:
  - layers > fragments
“INSIDE – OUT”

• SHOULD TARGET FASTEST SPREADING PLANTS (Moody and Mack 1988)

• FASTEST-SPREADING ARUNDO ARE IN THE FLOOD ZONE (slowest are outside)
SUMMARY

• Layers – 0.5 year and 1.5 year-old
• Layering was common in the flood zone
• Layering is an important mode of spread
  -- Expansion of clumps: Layers > rhizomes
  -- Reproduction: Layers >> fragments
• Current control strategy ("Top-down") needs to be reconsidered
• An "Inside-out" strategy is likely to be more effective