

**QUICK GUIDE FOR GREENHOUSE OWNERS
ON "NEW PEST RESPONSE GUIDELINES"
(The "Action Plan" issued January 15, 2004)**

The Society of American Florists and the American Nursery and Landscape Association are issuing the following to help you know what to expect during a quarantine. This document does not provide all of the legal background, references and similar details found in the Action Plan. **However, it is intended as a "quick guide" to be used in the field, so that growers know what to anticipate as their greenhouses are undergoing inspection under the Action Plan.** Inspectors should be aware that you have received this "Quick Guide," which has been reviewed by APHIS. The inspectors themselves will be referring primarily to Section 5 of the Action Plan, which can be found at <http://www.aphis.usda.gov/ppq/ep/ralstonia/rasltoniaactionplanv4web.pdf>

The current quarantine and destruction procedures are taking place in accordance with "Emergency Action Notifications" which will use the following wording or some slight modification.

"All Americana Coral, Americana Bright Red, and Americana Cherry Rose II geranium (Pelargonium spp.) plant shipments received from Goldsmith Plants or one of their rooting stations since August 2003 are prohibited from movement pending further notification by USDA APHIS PPQ and must be destroyed in accordance with USDA policies. Any other plant material that may have been exposed by common irrigation systems, or by unsanitary nursery cultural practices are also subject to this action. All host plants associated with the above exhibiting symptoms of wilt must be reported immediately to USDA APHIS PPQ and held until further notice. No other potential host material of *Ralstonia solanacearum* race 3 biovar 2 may leave greenhouses containing suspect plant material until further evaluations can be made. The above listed geranium varieties and all potentially infested material will be destroyed either by incineration, steam sterilization, or an approved landfill in accordance with USDA policies. Areas housing infected material shall be disinfected according to USDA protocols."

The notifications were issued pursuant to an official notice from APHIS on January 5, 2004. A subsequent communication from APHIS to its regional offices stated as follows:

"Please instruct inspectors to follow the Action Plan (see <http://www.aphis.usda.gov/ppq/ep/ralstonia/index.html>, Appendix 3 not included). Pay particular attention to changes from the Action Plan of last year, such as how to determine which additional plants need to be destroyed beyond the three varieties, because of potential infection. **We are hopeful destruction is minimal and restricted to the three varieties where conditions allow it (see the Action Plan), and that disinfection may proceed without keeping facilities on extended holds. It is our intention to allow greenhouse/nursery facilities to be back in operation ASAP.** We hope these actions prevent *Ralstonia solanacearum* race 3 biovar 2 from spreading, and that our actions have minimal negative impact to industry and the public."
[Emphasis added.]

1. Note that the procedures this year differ very significantly from the procedures followed under last year's Action Plan. The intent of the 2004 Action Plan is to minimize destruction and, insofar as possible, to restrict destruction to the following three Goldsmith varieties, imported from the Goldsmith facility in Guatemala or supplied from one of its rooting stations since August, 2003.

Americana Bright Red
Americana Coral
Americana Cherry Rose II

2. It is important that you understand HOW *Ralstonia solanacearum* (either of Race 1 or Race 3) spreads. Only *Ralstonia solanacearum*, Race 3, Biovar 2, (R3B2) is a quarantine pest. Race 1 is endemic in the southern U.S. and is not a quarantine pest.

Ralstonia is a bacterial plant disease, not communicable to humans. It is transmitted through contaminated soil, irrigation water, equipment, or personnel. Studies are currently underway to determine temperatures at which the Race 3 bacteria can survive in soil (Race 1 does not overwinter in cold northern climates). The bacteria can be spread by water running through contaminated soil, and in such ways as on soiled shoes from contaminated areas.

Ralstonia is NOT an airborne disease. It is NOT a disease which would be communicated by water splashing when watering the plant from above. Recent research, conducted in 2003, has shown that *Ralstonia* does NOT spread through leaf-to-leaf contact, or through normal shipping, planting or pot-handling procedures. It does not spread, for example, when a grower receives a shipment of rooted or unrooted cuttings in a box, and then takes those plants out of the box and plants them in potting material. It would not be spread by a grower moving plants around the greenhouse. *Ralstonia* would ONLY be spread in the greenhouse under the "High-Risk" (or, possibly, under the "Reduced Risk") conditions described below.

R3B2 on geraniums is of concern (in addition to the obvious harm it causes geraniums themselves) because of the possibility that, if diseased geraniums were sold and happened to be planted into the landscape, they could transfer the bacteria to other host crops, like potatoes, tomatoes, peppers, or other solanaceous crops, or to the weed "nightshade." Note that tobacco is NOT a host of *Ralstonia* of this race, so there is no concern about contaminating tobacco fields.

Ralstonia is a bacterial disease, which begins with bacteria entering the plant either through the roots by contaminated irrigation water, or through a major wound on the plant (like a knife cut). The bacteria grow, with the speed of growth generally dependent on the temperature and growing conditions, and spread upwards through the plant's vein (xylem) system. Eventually, enough bacteria grow and spread upwards, preventing water and nutrients from reaching the upper plant, and leaves may begin to wilt. Finally, when the vascular system is clogged to the point where water and nutrients can't get to the plant's leaves, the plant wilts and dies.

3. What is to be destroyed? Inspectors have been provided with lists of nursery facilities which have been, or will be, issued Emergency Action Notifications (EAN) notifying them that the three suspect varieties listed above are to be held and destroyed under supervision. All geraniums and other R3B2 host plants are to be held, pending the inspection. As soon as the

extent of potentially infected plants can be determined, all others can be immediately released.

APHIS hopes to keep destruction minimal and restricted to the three varieties so long as conditions allow (see paragraphs 6 and 7 below). Inspectors are to visit those nursery facilities as soon as possible, identify themselves as a USDA or state regulatory official, and speak to the nursery owner or manager. Since inspectors could inadvertently spread *Ralstonia* during the inspection, they should use disposable gloves and booties changed between visits and wash their hands with antimicrobial soap or disinfectant before inspecting.

4. The inspector will ask the nursery owner/manager to fill out a questionnaire (copy attached). They will also ask the nursery owner/manager to produce invoices and shipping lists associated with the three suspect varieties. However, remember that only the three suspect varieties are to be destroyed, in the absence of other conditions listed in paragraphs 7, 8 and 9 below.
5. The hold is NOT to be interpreted to:
 - a) prohibit the movement of plants in a greenhouse
 - b) say that plants other than the ones on hold cannot be cared for in a normal and sanitary manner
 - c) prohibit the relocation of suspect geranium shipments and potentially infected plants to a segregated area away from other plants. Inspectors are to rely on records of the nursery owner/manager for plants moved, destination of plants sold, and cultural practices employed.

The inspector is to keep a detailed accounting of the numbers and types of each plant variety held and destroyed. See page 5.5 of the Action Plan.

6. All plants of the three varieties listed above received since August, 2003, are to be destroyed, in accordance with the procedures in Section 6 (beginning on page 6.1) of the Action Plan. They do not need to be tested. **Except as provided in paragraphs 7, 8 and 9 below, no other plants should be held or destroyed. You will note that it is very important for you to have kept your varieties separate, in order to minimize possible cross-contamination and potential destruction.**
7. The following subparagraphs describe "high-risk" situations which *might* require the destruction of plants in addition to the three listed varieties. Some of these situations will require individual inspector judgment and possible consultation with the APHIS regional office.
 - a) *Plants beneath the drip line of suspect geraniums.* -- because *Ralstonia* bacteria are easily shed in water, plants, regardless of species, directly below hanging suspect geraniums are at high risk of soil contamination so must be included in destruction. The same is true for plants stored under benches if those benches could allow contaminated water to drip down onto the plants underneath.
 - b) *Plants in the same pots with suspect geraniums.* Infected geraniums in the same pots with other plants can easily infect them through water, soil, or root contact. This includes hosts and non-hosts.

- c) *Plant propagation from suspect geraniums has occurred.* Any plants propagated from cuttings taken from suspect geraniums are, of course, at high risk for infection. They will, of course, be the same varieties as the three suspect varieties listed above.
 - d) *Plants on a shared irrigation system with suspect geraniums* -- the most efficient method of spread for *Ralstonia* is through water that came in contact with infected plants. It is therefore necessary to hold all plants (hosts and non-hosts) that are on irrigation systems that allow for water flow from one plant to the next. The following are various irrigation situations to look for:
 - i) Sub-irrigation, ebb and flow, or flood irrigation: pots sit in a pan and are irrigated by flooding the pan in various ways.
 - ii) backflow prevention: nearly all irrigation systems have check valves as a safeguard to prevent contaminated water from backing up into the general water supply. If systems lack backflow prevention, there is a high risk of general contamination throughout the system from infected material.
 - e) *Plants in facilities where sanitary cultural practices are not in place* -- Using grafting knives for making cuttings or grooming plants without disinfection of tools between varieties is a high-risk factor in transmitting the bacteria to other host plants.
 - f) *Plants placed on the ground, on plastic sheeting or other material that allows puddling between plants* --Because the bacteria spread by water, there is a risk that puddling between plants will cause uptake of bacteria by healthy plants if water has flowed from infected plants in this way. The extent to which this occurs needs to be assessed by observation and further evaluations or monitoring may be necessary.
8. The following greenhouse practices are considered to be reduced risk. The inspector can evaluate the degree to which such practices may have taken place and, if necessary, should consult with supervisor, SPHD, SPRO, or regional office. However, these practices are not considered as high-risk for spreading the bacteria to other plants:
- a) *Plants that were not segregated from suspect geraniums* -- recent information shows that leaf-to-leaf contact between geraniums is NOT a viable method of pathogen spread, so there is little to no risk of plants in the same proximity of infected plants becoming contaminated by contact.
 - b) *Plants that were pinched, defoliated, disbudded by hand* -- this method of grooming presents less risk of spread than by the use of cutting tools, but some degree of sanitation between varieties is necessary.
9. Wilt symptoms can be difficult to interpret. Even though inspectors are asked to look at the plants to see if they find obvious wilt symptoms (see photographs), the inspector should be very careful not to assume that *Ralstonia* is present unless the plant is tested and confirmed positive to the *Ralstonia* species level (in other words, tested positive as *Ralstonia* without determining the specific race of *Ralstonia*). Only plants showing wilting symptoms are to be sampled and submitted through a diagnostic laboratory (see Appendix 4 of the Action Plan). Remember that wilting is also caused by other diseases, or by something as simple as lack of water, so check to see if the drip line that waters the plant is working, for example, to make sure that the plant is getting water.

Random sampling of plants not showing symptoms should NOT be conducted. Procedures for taking and shipping samples are described in Section 4.1 of the Action Plan.

10. Once an investigation determines that suspect geraniums along with any associated potentially infected plants have been destroyed, and the necessary areas disinfected, the greenhouse should be released from the EAN. (See pages 5.9-5.10 of the Action Plan for details.) Note that plants not suspect or not potentially infected may be released before the entire greenhouse is released.

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