



[Environment Horticulture Program Research Summaries](#)

IR-4 Environmental Horticulture Program ISM-555 Crop Safety

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Acknowledgements

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Abstract

ISM-555 is a new insecticide being developed by Syngenta for management of scale, mealybugs, thrips, beetles and other pests on environmental horticulture crops. The IR-4 Project completed 22 crop safety trials on 16 environmental horticulture plant species or genera during 2018 to 2021. In these trials, all 12 species or genera exhibited minimal or no injury. Three species (*Impatiens walleriana*, *Petunia x hybrida*, and *Tagetes erecta*) exhibited minimal or no injury in at least 3 trials and 9 additional species or genera exhibited minimal or no injury in the limited number of trials (one or two) for each crop.

Introduction

ISM-555 is a new insecticide being developed by Syngenta for management of scale, mealybugs, thrips, beetles and other pests on environmental horticulture crops. The IR-4 Project completed 22 crop safety trials on 12 environmental horticulture plant species or genera during 2020 to 2021.

Materials and Methods

ISM-555 was applied as foliar treatment typically 3 times at approximately 14 days intervals. The application rates were 11.5, 23 and 46 fl oz per 100 gal, plus a water treated control. A minimum of ten plants (replicate treatments) were required. Phytotoxicity was recorded on a scale of 0 to 10 (0 = no phytotoxicity; 10 = complete kill). Phytotoxicity was rated weekly up to 6 weeks after initial application. For IR-4 testing, the following protocols were used: 20-005 and 21-005. For more detailed materials and methods, including application rates for various products, please visit <https://www.ir4project.org/ehc/ehc-registration-support-research/env-hort-researcher-resources/#Protocols> to view and download these protocols.

ISM-555 was supplied to researchers (See list of researchers in Appendix 1) by Syngenta.

Results and Summary

Based on the type and nature of injury seen with pesticide applications, tested plant species were placed into four categories: 1) no significant phytotoxicity or growth differences from the untreated check or any injury was transitory, 2) no or minimal transitory injury seen at the 1X rate, but the 2X and/or 4X rates did cause significant phytotoxicity, 3) significant injury at the 1X rate sufficient to recommend growers not utilize ISM-555, and 4) more data are needed to make informed recommendations.

Phytotoxicity

Across all crops tested, ISM-555 exhibited no or minimal negative impact on 16 plant species or genera. Three crops (*Impatiens walleriana*, *Petunia x hybrida*, *Tagetes erecta*) exhibited minimal or no injury in at least 3 trials (Table 1) and 9 species or genera exhibited minimal or no injury in the limited number of trials (one or two) for each crop (Table 4).

Please see Table 5 for a summary of the individual trial results.

Table 1. List of ISM-555 treated crops with no or minimal transitory injury.

Impatiens walleriana
Petunia x hybrida

Tagetes erecta

Table 2. List of ISM-555 treated crops with no injury at 1X but significant injury at 2X or 4X.

None

Table 3. List of ISM-555 treated crops with significant injury at 1X.

None

Table 4. List of ISM-555 treated crops where more information is needed.

Chrysanthemum/Dendranthema sp.¹
*Euphorbia pulcherrima*¹
Gerbera sp.¹
*Pelargonium x hortorum*¹
Rosa sp.¹

*Tagetes patula*²
Verbena sp.¹
Viburnum sp.¹
*Viola x wittrockiana*¹

¹ No injury in 1 trial

² No injury in 2 trials

Table 5. Detailed Summary of Crop Safety Testing with ISM-555.

Notes: Table entries are sorted by crop Latin name. Only those trials with research reports received by 9/3/2021 are listed below.

| PR# | Crop | Production Site | Researcher | State | Year | Application Type | Results |
|-------|--|-----------------------|------------|-------|------|------------------|--|
| 34099 | Chrysanthemum, Garden (Chrysanthemum/Dendranthema sp.) | Field Container | Klett | CO | 2020 | Foliar | No injury or growth reduction, and no effect on flower production or bloom time, with 11.5, 23 and 46 fl oz per 100 gal + Capsi; applied 3 times weekly. |
| 34617 | Poinsettia (Euphorbia pulcherrima) | Shadehouse/Lath House | Cheng | HI | 2020 | Foliar | No injury or growth reduction with 11.5, 23 and 46 fl oz per 100 gal. |
| 34124 | Poinsettia (Euphorbia pulcherrima) 'Prestige Red' | Greenhouse | Uber | CA | 2020 | Foliar | No injury and growth reduction with 11.5, 23 and 46 fl oz per 100 gal + Capsil applied twice weekly. |
| 34096 | Transvaal Daisy (Gerbera sp.) 'Jaguar Mix' | Greenhouse | Hotchkiss | MI | 2021 | Foliar | No significant injury or growth reduction at 11.5, 23, or 46 fl oz per 100 gal. |
| 34125 | Impatiens, Common Garden; Buzzy Lizzy (Impatiens walleriana) 'Beacon White' | Greenhouse | Bodine | NJ | 2020 | Foliar | Virtually no injury or growth reduction with 11.5, 23 and 46 fl oz per 100 gal + Capsil applied twice weekly. |
| 34125 | Impatiens, Common Garden; Buzzy Lizzy (Impatiens walleriana) 'Dazzler Rose' | Greenhouse | Gilrein | NY | 2020 | Foliar | No injury to foliage or flowers with 11.5, 23, and 46 fl oz per 100 gal applied twice. |
| 34125 | Impatiens, Common Garden; Buzzy Lizzy (Impatiens walleriana) 'Super Elfin XP Coral' | Greenhouse | Gilrein | NY | 2020 | Foliar | No injury to foliage or flowers with 11.5, 23, and 46 fl oz per 100 gal applied twice. |
| 34125 | Impatiens, Common Garden; Buzzy Lizzy (Impatiens walleriana) 'Baby' | Greenhouse | Nansen | CA | 2020 | Foliar | No injury nor significant growth reduction with 0.9, 1.8 and 3.6 ml per liter applied 3 times weekly. |
| 34125 | Impatiens, Common Garden; Buzzy Lizzy (Impatiens walleriana) 'Super Elfin XP Violet' | Greenhouse | Vafaie | TX | 2020 | Foliar | No injury or significant growth reduction with 11.5, 23 and 46 fl oz per 100 gal applied 3 times weekly. |
| 34123 | Geranium, Zonal (Pelargonium x hortorum) 'Americana Dark Red' | Greenhouse | Hotchkiss | MI | 2021 | Foliar | No significant injury or growth reduction at 11.5, 23, or 46 fl oz per 100 gal |
| 34092 | Petunia (Petunia x hybrida) 'Tidal Wave Hot Pink' | Greenhouse | Bodine | NJ | 2020 | Foliar | No injury or growth reduction with 11.5, 23 and 46 fl oz per 100 gal + Capsil applied twice weekly. |
| 34092 | Petunia (Petunia x hybrida) 'Pretty Grand' | Greenhouse | Larson | KY | 2021 | Foliar | No significant injury at 11.5, 23 or 46 fl oz per 100 gal applied twice at weekly intervals. |
| 34092 | Petunia (Petunia x hybrida) 'Dreams Red' | Greenhouse | Vafaie | TX | 2021 | Foliar | No injury or growth reduction with 11.5, 23 and 46 fl oz per 100 gal applied twice biweekly. |
| 34100 | Rose (Rosa sp.) 'Radtko' | Field Container | Gilrein | NY | 2020 | Foliar | No injury or growth reduction with 11.5, 23 or 46 fl oz per 100 gal applied twice 7 d apart. |
| 34094 | Marigold, African (Tagetes erecta) 'Taishan Orange' | Greenhouse | Bodine | NJ | 2020 | Foliar | No injury or growth reduction with 11.5, 23 and 46 fl oz per 100 gal + Capsil applied twice weekly. |
| 34094 | Marigold, African (Tagetes erecta) 'Inca II Yellow' | Greenhouse | Nansen | CA | 2020 | Foliar | No significant injury nor growth reduction with 0.9, 1.8 and 3.6 ml per liter applied 3 times weekly. |
| 34094 | Marigold, African (Tagetes erecta) 'Taishan Yellow' | Greenhouse | Vafaie | TX | 2021 | Foliar | No injury or growth reduction with 11.5, 23 and 46 fl oz per 100 gal applied twice biweekly. |

| PR# | Crop | Production Site | Researcher | State | Year | Application Type | Results |
|-------|--|-----------------|------------|-------|------|------------------|--|
| 34095 | Marigold, French (Tagetes patula) 'Durango Red' | Greenhouse | Bodine | NJ | 2020 | Foliar | No injury or growth reduction with 11.5, 23 and 46 fl oz per 100 gal + Capsil applied twice weekly. |
| 34095 | Marigold, French (Tagetes patula) 'Disco Marietta' | Greenhouse | Hotchkiss | MI | 2021 | Foliar | No significant injury or growth reduction at 11.5, 23, or 46 fl oz per 100 gal; nontreated and capsil controls had injury due to thrips infestations while the treated plants did not. |
| 34097 | Vervain (Verbena sp.) 'Lanai Peach' | Greenhouse | Hotchkiss | MI | 2021 | Foliar | No significant injury or growth reduction at 11.5, 23, or 46 fl oz per 100 gal |
| 34101 | Arrowwood (Viburnum sp.) | Field Container | Wade | SC | 2021 | Foliar | No injury at 11.5, 23 or 46 fl oz per 100 gal applied twice a week apart. |
| 34093 | Pansy, Large Flowering; Wittrock's Violet (Viola X wittrockiana) | Greenhouse | Bodine | NJ | 2020 | Foliar | No injury at 11.5, 23 or 46 fl oz per 100 gal applied twice at a 7 day interval. |

Label Suggestions

In this report, all plants exhibited no or minimal injury after foliar treatments of ISM-555 at 11.5, 23 and 46 fl oz per 100 gal, suggesting that this active ingredient is safe to ornamental horticulture crops. Given the lack of phytotoxicity across so many different plant species and genera, it is suggested that all the 16 plants in Table 1 and Table 4 that showed no injury be placed on the ISM-555 label if SePro has similar results on these crops. Or a general statement can be placed on the label such as 'has not been demonstrated to cause damage on various ornamental plant species according to labeled use instructions. ISM-555 may be used on a wide number of crops but must be tested on a limited portion of the crop prior to applying to the whole crop if the grower has no previous experience applying ISM-555 to that crop'.

Appendix 1: Contributing Researchers

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| Dr. Zhiqiang Cheng | University of Hawaii at Manoa Department of Plant and Environmental Protection Sciences Honolulu, HI 96822 |
| Mr. Dave Bodine | Rutgers University Cream Ridge Experiment Station 283 Rt. 539 Cream Ridge, NJ 08514 |
| Ms. Erica Hotchkiss | Michigan State University Dept. of Entomology East Lansing, MI 48824 |
| Dr. Jim Klett | Colorado State University 601 S. Howes Street, USC 4 th Floor Fort Collins, CO 80523 |
| Dr. Jonathan Larson | University of Kentucky Dept. of Entomology S-225 Agricultural Center North Lexington, KY 40546-0091 |
| Dr. Christian Nansen | University of California, Davis Department of Entomology and Nematology One Shields Avenue Davis CA 95616 |
| Mr. Buzz Uber | Crop Inspection Service 31130 Hilltop Drive Valley Center, CA 92082 |
| Dr. Erfan Vafaie (<i>past affiliate</i>) | Texas A&M University Texas Agrilife Extension Service Overton TX 75684 |
| Mr. Paul Wade | USDA-ARS US Vegetable Laboratory 2700 Savannah Highway Charleston SC 29414 |