

IR-4: HERBICIDE EFFICACY AND PHYTOTOXICITY IN ORNAMENTAL CROPS

Vegetable and Forage Crops Research Unit

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The IR-4 Ornamentals Program develops efficacy and phytotoxicity data on disease, insect and weed management tools for use in greenhouses, nurseries, landscapes, interiorscapes, Christmas tree farms, sod farms, the production of forestry tree seedlings and other non-food specialty crop uses. The IR-4 Program generates information to support the registration of new pest management tools for the ornamental industry and other specialty crops. IR-4 receives funds from the U.S. Department of Agriculture and the program is coordinated from the head office in Princeton, New Jersey.

The IR-4 Program was initiated in 1977 to address the pest management and plant growth regulator needs of growers and producers of specialty and low acreage crops. Over time the ornamental program expanded to cover not only ornamental horticulture plants grown in greenhouses and nurseries, but landscape plantings, Christmas tree farms, sod farms and interiorscapes.

Research activities start with growers, landscape care professionals, researchers, or extension agents identifying a pest management need – where weed and other pest management tools are not available or effective, such as for a newly introduced pest or a pest that cannot be easily managed. The majority of the active ingredients registered for use ornamental horticulture were registered through efforts of the IR-4 program.

Over the program's history, the primary focus has been generating crop safety information and adding new crops to pesticide labels. Beginning with the 2003 Annual Workshop, high priority projects have been established each year to focus on key pest management issues within each pest management discipline.

ARS-Prosser has participated in the IR-4 Program since the late 1970's, completing approximately 225 field trials on minor food use crops. The IR-4 program has provided growers with the majority of the current pest management tools registered in vegetable, fruit, and specialty crops. Since 2003, the ARS-Prosser and Northwest Horticulture, Mabton, WA, have worked together to complete over 405 ornamental field container trials, using 38 different herbicides and 11 greenhouse trials on 125 different ornamentals. The data from each field or greenhouse trial is reviewed by IR-4 Headquarters and ultimately used in petitions submitted to EPA for new pesticide tolerances and registrations. .

Northwest Horticulture in Mabton, WA donates perennial ornamental plants, containers, and potting soil mix for most of our ornamental trials through a cooperative agreement with USDA-ARS. In addition, Weyerhaeuser Company donates forest trees and Bailey Nursery and J. Frank Schmidt & Son Co. donates trees and shrubs for numerous IR-4 trials. Their assistance and donations have allowed the ARS-Prosser IR-4 ornamental research program to accomplish much more than they otherwise could on limited funding.

In 2011, the ARS Prosser is also conducting crop safety and efficacy trials on 5 food use crops (asparagus, peas, grapes, blueberries, and Timothy hay).

2003-2011: TOTAL 125 DIFFERENT ORNAMENTAL PLANT SPECIES

Common Names	Scientific Names	Common Names	Scientific Names
Alumroot	<i>Heuchera x brizoides</i>	Japanese Spurge	<i>Pachysandra terminalis</i>
Alumroot	<i>Heuchera x sanguinea</i>	Joe Pye Weed	<i>Eupatorium dubium</i>
Anemone	Anemone sp.	Lady's Mantle	<i>Alchemilla mollis</i>
Angel Hair	<i>Artemisa schmidtiana</i>	Lavender	<i>Lavandula</i>
Arborvitae	<i>Thuja occidentalis</i>	Lavender cotton	<i>Santolina</i>
Arrowwood	<i>Viburnum dentatum</i>	Lily, Plantain	<i>Hosta</i>
Aster	<i>Aster ericoides</i>	Maidengrass	<i>Miscanthus sinensis</i>
Aster, New York	<i>Aster novi-belgii</i>	Muhly, hairyawn	<i>Muhlenbergia capillaris</i>
Astilbe	Astilbe sp.	Northern Sea Oats	<i>Chasmanthium latifolium</i>
Beard-Tongue	<i>Penstemon hartwegii</i>	Oak	<i>Quercus rubra</i> Red
Bee Balm	<i>Monarda didyma</i>	Ornamental Strawberry	<i>Fragaria</i> sp.
Bellflower	<i>Campunula carpatica</i>	Pampas Grass	<i>Cortaderia</i> sp.
Blazing Star	<i>Liatris spicata</i>	Peony	<i>Paeonia</i>
Bleeding Heart	<i>Dicentra spectabilis</i>	Peony	<i>Paeonia lactiflora</i>
Blue Fescue	<i>Festuca glauca</i>	Peppermint	<i>Mentha x piperita</i>
Bluestar	<i>Amsonia</i>	Periwinkle	<i>Vinca minor</i> L.
Boneset	<i>Eupatorium rugosum</i>	Phlox, Creeping	<i>Phlox subulata</i>
Box elder, Variegated	<i>Acer negundo</i> 'Variegatum'	Phlox, Perennial	<i>Phlox paniculata</i>
Butterfly Bush	<i>Buddleia davidii</i>	Pincushion Flower	<i>Scabiosa</i>
Camellia, Mountain	<i>Stewartia</i> sp.	Pinks	<i>Dianthus</i> , sp.
Candytuft	<i>Iberis sempervirens</i>	Primrose	<i>Oenothera</i> sp.
Canna	<i>Canna</i> sp.	Red Hot Poker	<i>Kniphofia uvaria</i>
Cardinal flower	<i>Lobelia</i>	Redbud	<i>Cercis canadensis</i>
Catmint 'Dawn to Dusk'	<i>Nepeta grandiflora</i>	Ribbon Grass	<i>Phalaris arundinacea</i>
Cinquefoil, Shrubby	<i>Potentilla fruticosa</i>	Rosa 'Caramba'	Rose x 'Tanabamar'
Clematis	<i>Clematis</i> sp.	Rose	<i>Rosa hybrid</i>
Columbine	<i>Aquilegia</i>	Rose Mallow	<i>Hibiscus</i> sp.
Coral Bells	<i>Heuchera sanguinea</i>	Sage	<i>Salvia x splendens</i>
Cornflower, Orange	<i>Rudbeckia fugida speciosa</i>	Sage	<i>Salvia x sylvestris</i>
Cornflower, Purple	<i>Echinacea purpurea</i>	Sage, 'Blue Hill'	<i>Salvia nemorosa</i>
Creeping Lilyturf	<i>Liriope Muscari</i>	Sage, 'Snow Hill'	<i>Salvia splendens</i>
Daylily	<i>Hemerocallis</i> sp.	Sedge	<i>Carex buchananii</i>
Dead Nettle	<i>Lamium</i> sp.	Shasta Daisy	<i>Chrysanthemum x superbum</i>
Delphinium	<i>Delphinium</i> sp.	Silver Grass	<i>Miscanthus sinensis</i>
Dogwood, Red Osier	<i>Cornus sericea</i>	Silver Mound	<i>Artemisia schmidtiana</i>
Eastern Hemlock	<i>Tsuga</i> sp.	Southwestern White Pine	<i>Pinus strobus</i> ormis
Elm	<i>Ulmus</i> 'Homestead'	Speedwell, Brooklime	<i>Veronica</i>
English Ivy	<i>Hedera helix</i> L. ssp. <i>Helix</i>	Speedwell, Spike	<i>Veronica spicata</i>

False spirea	<i>Astilbe simplicifolia</i>	Spiderwort	<i>Tradescantia andersoniana</i>
False Sunflower, Smooth Oxeye	<i>Heliopsis helianthoides var. scabra</i>	Spotted Dead Nettle	<i>Lamium maculatum</i>
Feather Reed Grass	<i>Calamagrostis x acutiflora</i>	Stonecrop	<i>Sedum spurium</i>
Fir, Douglas	<i>Pseudotsuga menziesii</i>	Stonecrop	<i>Sedum telephium</i>
Fir, Fraser	<i>Abies fraseri</i>	Sundrops	Oenothera sp.
Fleabane	<i>Erigeron glaucus</i>	Switch Grass	<i>Panicum virgatum</i>
Fountain Grass	<i>Pennisetum alopecuroides</i>	Thoroughwort	<i>Eupatorium rugosum</i>
Foxglove	<i>Digitalis purpurea</i>	Thrift Sea Pinks	<i>Armeria maritima</i>
Foxglove	<i>Digitalis thapsi</i>	Thyme, Creeping	<i>Thymus praecox</i>
Gaura	<i>Gaura lindheimeri</i>	Tickseed	<i>Coreopsis auriculata</i>
Geranium	Geranium magniflorum	Turkish Veronica	<i>Veronica liwanensis</i>
Geranium	Geranium x cantabrigiense	Variagated Sedge	Carex oshimensis 'Evergold'
Golden Rockets	<i>Lihustis dentata</i>	Verbena	Verbena sp.
Goldenrod	Solidago sp.	Vervain	<i>Verbena canadensis</i>
Hardy Ice Plant, Yellow	<i>Delosperma nubigenum</i>	Western Hemlock	<i>Tsuga heterophylla</i>
Hawthorn, Thornless Cockspur	Crataegus crus-galli 'Inermis'	Western Red Cedar	<i>Thuja plicata</i>
Heart-leaved Bergenia	<i>Bergenia cordifolia</i>	Winged Burning Bush	<i>Euonymus alatus 'Compactus'</i>
Hellebore, Pink Lady	<i>Helleborus hybrid sp.</i>	Witch Alder (zone 5)	Fothergilla major 'Mt. Airy'
Hellebore, Royal Heritage	<i>Helleborus hybrid sp.</i>	Woolly Thyme	<i>Thymus psudolanuginosis</i>
Hen and Chicks	Sempervivum tectorum	Wormwood	<i>Artemisia ludoviciana</i>
Hosta	<i>Hosta sp.</i>	Wormwood 'Powes Castle'	Artemisia arborescens x absinthium
Hungarian Speedwell	<i>Veronica austraca spp. Teucrium</i>	Wormwood, 'Silver Brocade'	Artemisia stelleriana
Hyssop	<i>Agastache rugosa x foeniculum</i>	Yarrow	<i>Achillea millifolium</i>
Jacob's Ladder	<i>Polemonium boreale</i>	Yellow Ice Plant	<i>Delosperma numbegenum</i>
Japanese Blood Grass	Imperata cylindrica		