

The background of the slide is a collage of four images related to horticulture. The top-left image shows bare, brown tree branches with green ties. The top-right image shows a large nursery area covered with black plastic mulch and rows of plants. The bottom-left image shows several black pots filled with green plants that have small purple flowers. The bottom-right image shows a close-up of bamboo stalks with green leaves.

IR-4: 50 Years and Counting

Cristi L Palmer

IR-4 Ornamental Horticulture Program
Manager

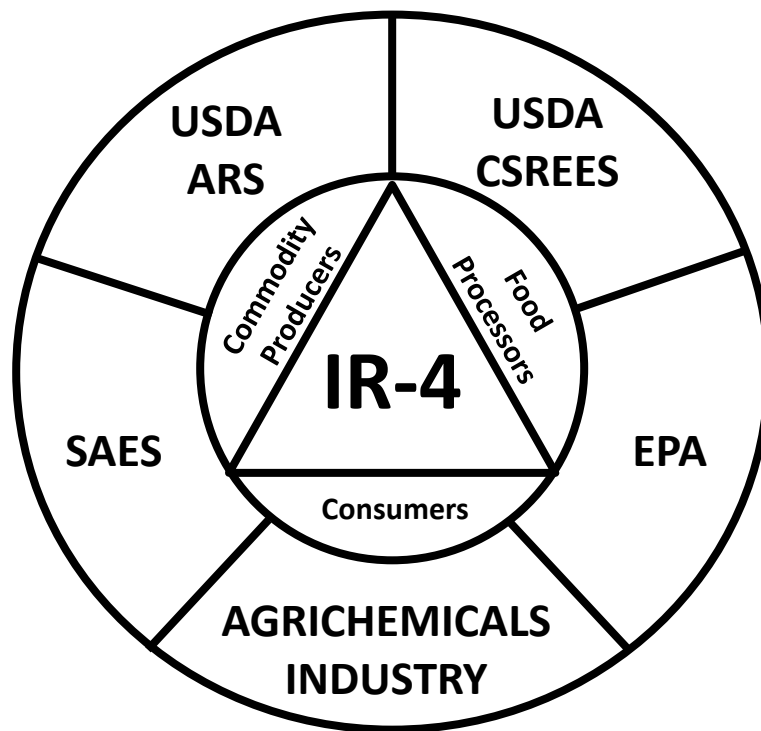


IR-4 Celebrates 50 Years





1963: The IR-4 Project was initiated





1977: The Ornamentals Program

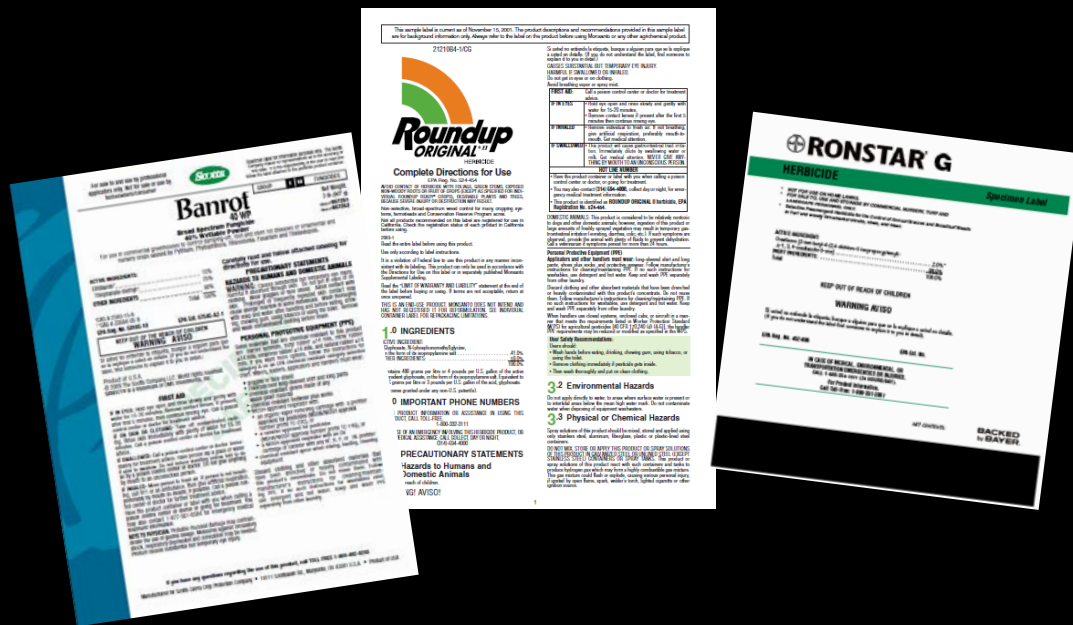
- First Workshop April 1977 in St. Louis, MO
- 10,000 Needs condensed into 5621 Project Requests
- Second Workshop in December 1977 in Dallas, TX to prioritize requests
- Data sent from all over the US



Median Household Income: \$13,572

1978: First Registrations

- New uses for Banrot, glyphosate and Ronstar were registered by EPA



Active Ingredients Screened by IR-4 during the 2000's (Pathology & Entomology)

Fungicides/Nematicides

Ampelomyces quisqualis iso

(FRAC NC)

Azoxystrobin (FRAC

Burkholderia (FRAC

Captan (FRAC M4

Chlorothalonil (FRAC

Copper (FRAC M1

Copper hydroxide (FRA

Copper sulphate pentahydrate

Dodemorph (FRAC

Etridiazole (FRAC

Fenarimol (FRAC

Fenhexamid (FRAC

Fenitrothion (FRAC

Ferbam (FRAC M

Fipronil (FRAC 2B

Fluazinam (FRAC

Fosetyl Al (FRAC

Fludioxonil (FRAC

Flutalolil (FRAC

Fosetyl Al (FRAC

Glitioladium virens (FRA

Imazalil (FRAC

Imazalil (FRAC

Iprodione (FRAC

Mefenoxam (FRAC

Metalaxyl (FRA

Oxycarboxin (FR

Oxytetracycline (FR

PCNB (FRAC

Ethazole (FRAC

Rotenone + Piperonyl

(IRAC 21 + IRAC

Sethoxydim (WS

Streptomycin (FR

Thiabendazole (FR

Thiophanate methyl (FR

Triadimefon (FR

Trifluralin (FR

Triflumizole (FR

Triforine

Vinclozolin (FR

Trichoderma harzianum (F

Trifloxystrobin (FRAC

Triflumizole (FRAC

Triforine

Cinnamaldehide (FRAC

Fenamiphos (IRAC

Sodium tetrathiocarbonate (F

Bactericides

Bacillus mycoides isolate J

(FRAC NC)

Bacillus subtilis (FRAC 44)

Bacillus subtilis var

amyloliquefaciens strain

FZB24 (FRAC 44)

Bacillus subtilis GB03

(FRAC 44)

Copper sulfate (FRAC M1)

Caprylic acid (FRAC NC)

Citrus extraction (FRAC NC)

Copper Hydroxide

(FRAC M1)

Copper salts of fatty and rosin

acids (FRAC M1)

Copper sulfate pentahydrate

(FRAC M1)

Copper sulphate pentahydrate

(FRAC M1)

Didcyl dimethyl ammonium

chloride

Extract of *Reynoutria*

sachalinensis (FRAC NC)

Fish oil (FRAC NC)

Fosetyl Al (FRAC 33)

Fruit and vegetable extract

(FRAC NC)

Kavagacycin (FRAC 24)

Laminarin (FRAC P)

Mancozeb (FRAC M3)

NAI-4201 (FRAC P)

Oxytetracycline (FRAC 41)

Pantoea agglomerans strain

E325 (FRAC NC)

Phosphorus acid salts

(FRAC 33)

Potassium bicarbonate

(FRAC NC)

Potassium phosphite

(FRAC 33)

Silver

Sodium borate decahydrate /

copper pentahydrate

(FRAC M1)

Sodium tetraborate pentahydrate

decahydrate

SP2015

(FRAC 11 + FRAC 27)

Streptomyces lydicus WYEC

108 (FRAC NC)

Streptomyces sulfate

(FRAC 25)

Furfural

Glitioladium catenulatum

Strain J1446 (FRAC NC)

Harpin

Hydrogen dioxide

Hymexazol (FRAC 32)

Iprodione (FRAC 2)

Kresoxim-methyl

(FRAC 11)

Fungicides/Nematicides

Acibenzolar-S-methyl

(FRAC P)

Ametotradin +

dimethomorph (BAS 651)

(FRAC 45 + FRAC 40)

Ampelomyces quisqualis

isolate M-10 (FRAC NC)

Azoxystrobin (FRAC 11)

Bacillus licheniformis

SB3086

Bacillus subtilis (FRAC 44)

Bacillus subtilis var

amyloliquefaciens strain

FZB24 (FRAC 44)

Bacillus subtilis GB03

(FRAC 44)

Boscalid (FRAC 7)

Caprylic acid (FRAC NC)

Captan (FRAC M4)

Chlorine dioxide

Chloroneb (FRAC 14)

Chlorothalonil (FRAC M5)

Cinnamaldehide

(FRAC NC)

Clothianidin (FRAC 4A)

Copper Hydroxide

(FRAC M1)

Copper salt-Fatty & Rosin

Acid (FRAC M1)

Copper sulfate pentahydrate

(FRAC M1)

Cyazofluamid (FRAC 21)

Cymoxanil (FRAC 27)

Cyprodinil (FRAC 9)

Dimethomorph (FRAC 40)

Dimethomorph (FRAC 40)

EBDC (FRAC M3)

Etridiazole (FRAC 14)

Extract of *Reynoutria*

sachalinensis (FRAC NC)

Famoxadone + Cymoxanil

(FRAC 11 + FRAC 27)

Fenamidone (FRAC 11)

Fenarimol (FRAC 3)

Fenhexamid (FRAC 17)

Fluazinam (FRAC 29)

Fludioxonil (FRAC 12)

Flupicolide (FRAC 43)

Fluoxastrobin (FRAC 11)

Flutalolil (FRAC 7)

Fosetyl Al (FRAC 33)

Furfural

Glitioladium catenulatum

Strain J1446 (FRAC NC)

Harpin

Hydrogen dioxide

Hymexazol (FRAC 32)

Iprodione (FRAC 2)

Kresoxim-methyl

(FRAC 11)

Mancozeb (FRAC M3)

Mancozeb + Zoxamide

(FRAC M3 + FRAC 22)

Mandipropamid (FRAC 40)

Mameb (FRAC M3)

Mefenoxam (FRAC 4)

Metiram (FRAC M3)

Mono- and Dibasic Sodium

Potassium and Ammonium

Phosphites (FRAC 33)

Muscocod albus (FRAC NC)

Myclobutanil (FRAC 3)

PCNB (FRAC 14)

Phosphorus acid salts

(FRAC 33)

Polyoxin D (FRAC 19)

Potassium bicarbonate

(FRAC NC)

Potassium phosphite

(FRAC 33)

Propamocarb hydrochloride

(FRAC 28)

Pyraclostrobin (FRAC 11)

Reynoutria sachalinensis

(FRAC NC)

SA 11210

Sodium tetrathiocarbonate

(IRAC 1B)

SP2015

(FRAC 11 + FRAC 27)

Streptomyces lydicus WYEC

108 (FRAC NC)

Tebuconazole (FRAC 3)

Thiophanate-methyl

(FRAC 1)

Thiophanate-methyl +

Chlorothalonil (FRAC 1 +

FRAC M5)

TM-435

TM-459

Triadimefon (FRAC 3)

Trichoderma asperellum +

Trichoderma gamosii

(FRAC NC + FRAC NC)

Trichoderma hamatum strain

382 (FRAC NC)

Trichoderma harzianum

(FRAC NC)

Trichoderma harzianum Rfai

Strain KRL-AG2

(FRAC NC)

Trichoderma harzianum T-22

+ *Trichoderma virens* G-41

(FRAC NC + FRAC NC)

Trichoderma virens G41

(FRAC NC)

Trifloxystrobin (FRAC 11)

Triflumizole (FRAC 3)

Triconazole (FRAC 3)

Insecticides/Miticides

Abamectin (IRAC 6)

Acephate (IRAC 1B)

Acequinocyl (IRAC 20B)

Acetamiprid (IRAC 4A)

Azadirachtin (FRAC UN)

Beauveria bassiana

Beauveria bassiana + BW130

Beauveria bassiana + Sodium

tetraborate

decahydrate

Beauveria bassiana + BW533

Bifenazate (IRAC UN)

Bifenthrin (IRAC 3A)

Buprofezin (IRAC 16)

Carbaryl (IRAC 1A)

Chlorantraniliprole (IRAC 28)

Chlorfenvinphos (IRAC 13)

Chlorpyrifos (IRAC 1B)

Clofentazine (IRAC 10A)

Clothianidin (FRAC 4A)

Cyantraniliprole (IRAC 28)

Cyfluthrin (IRAC 3A)

Cypermethrin (IRAC 3)

Daminozide

DEET

Deltamethrin (IRAC 3A)

Diazinon (IRAC 1B)

Dichlorobenzil (WSSA20)

Dimethoate (IRAC 1B)

Dimethyl (IRAC 1B)

Dinotefuran (IRAC 4A)

Diocetyl sodium succinate

Emamectin benzoate

(IRAC 6)

Endosulfan (IRAC 2A)

Esfenvalerate (IRAC 3A)

Etoxazole (IRAC 10B)

Extract of *Chenopodium*

ambrosioides

Fenbuconazole (FRAC 3)

Fenoxycarb (IRAC 7B)

Adorn™
FUNGICIDE

JUDO™
Miticide/Insecticide

Palladium™

Stature^{SC}
fungicide

Barricade®

KONTOS™

PENDULUM®
granule herbicide

SureGuard®
HERBICIDE

BroadStar™
HERBICIDE

Dow AgroSciences
Lontrel®
Turf and Ornamental
Herbicide

Pennant Magnum®

Dow AgroSciences
Conserve^{SC}
Turf and Ornamental
Insect Control
*Trademark of Dow AgroSciences LLC

PYLON Subdue^{MAXX}

Micora™

Regalia®
Biofungicide Concentrate

TOWERTM
HERBICIDE

ENDORSE®

MARENGO®

Orthene®
TURF, TREE & ORNAMENTAL WSP

RootShield[®] PLUS⁺ WP

FENSTOP™

FREEHANDTM
HERBICIDE

orvego
FUNGICIDE

Safari®
INSECTICIDE

Sanmite®
Miticide/Insecticide

Hachi-Hachi®
Insecticide

Overture®
INSECTICIDE

Insignia
FUNGICIDE

PageantTM
Fungicide

SEGWAY™
FUNGICIDE

2007-2013 Registrations

The
IR-4
Project

50th
ANNIVERSARY-2013

22,000+ Crop Uses

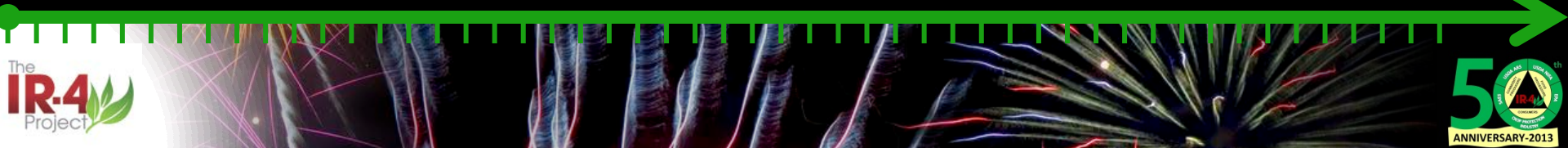
23,245 Studies

101+ Registered Products

60 – 70 researchers every year

30,250 Completed Trials

50% of archived records validated



IR-4 contributes more than **\$7.2 billion** to GDP and
supports **104,650 jobs**.

-- The Center for Economic Analysis at MSU, 2011



Invasive Species

- Cuban Laurel Thrips
- Euonymus Scale
- Madeira Mealybug
- Citrus Mealybug
- Oriental Beetle
- Japanese Beetle
- Asian Ambrosia Beetle
- Ramorum Blight



Invasive Species

- Q Biotype Whitefly
- Gladiolus Rust
- Chili Thrips
- Chrysanthemum White Rust
- Shipping of Invasive Arthropods
- Boxwood Blight
- Impatiens Downy Mildew
- Spotted Winged Drosophila
- Brown Marmorated Stink Bug

Special Projects



Budget Challenges

“For the past eight years, this Cooperative State Research Service special research grant program of pesticide clearance has greatly assisted in obtaining more prompt pesticide registrations for nursery crops when such pesticides are already registered for use on food or feed crops. Cancellation of the IR-4 Program, which costs approximately \$1.4 million per year, will make it necessary for nurserymen and florists to wait six to ten years for needed pesticide registrations – if they are granted at all.

We strongly urge the Congress to provide the necessary \$1.2 million to maintain the IR-4 pesticide clearance program. We also request \$2 million for the National Agriculture Pesticide Impact Assessment program. This request is made with the understanding that a fair share of the funding is used for ‘ornamental’ pesticide uses.”

-- Congressional testimony of American Nurserymen’s Association





What has made IR-4 so successful?



IR-4 Mission

Facilitate registration of sustainable pest management technology for specialty crops and minor uses

Purpose

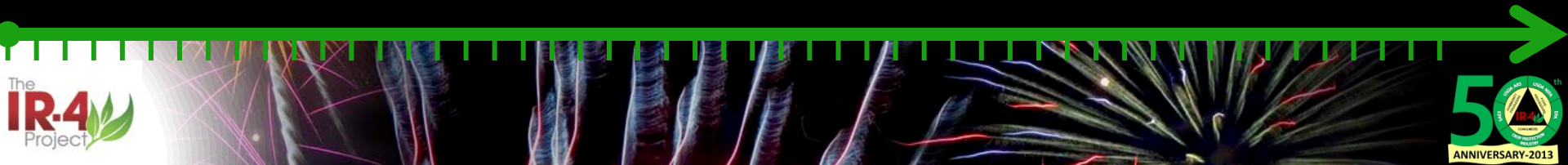


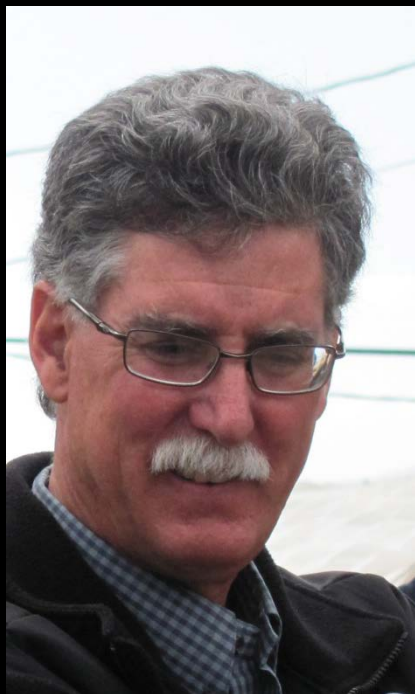
People





The Founding Fathers





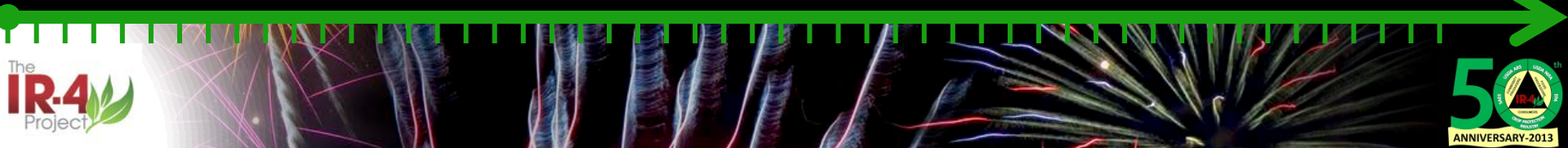
Over the years I know that IR-4 has been very important and instrumental in helping bring some of the minor use crop materials forward for our operations. Sometimes the work goes unrecognized because it happens behind the scenes without much fanfare. I view the IR-4 program as critically important especially to those of us in the “super specialty crop” area of agriculture because it is often times difficult or unprofitable for a manufacturer to register materials for our uses. IR-4 gives us the opportunity to broaden our arsenal against the ever increasing range of pests that challenge our farming operations. Without IR-4’s efforts our job would be much more difficult if not impossible.

– Mike A. Mellano, Mellano & Company



IR-4 is an invaluable resource for greenhouse and nursery growers – not just in helping make sure they have access to the chemical and biocontrol tools they need to control pests and diseases, but also to support research that helps them use those tools wisely. Specialty crop growers are definitely getting double and triple benefits from the IR-4 Program, because the program listens to the industry ... you hear our voices!

– Lin Schmale, Society of American Florists





You!

Thank you !



Funding for IR-4 Research:

USDA-NIFA

USDA-ARS

USDA-APHIS

Land Grant Institutions



The Chemical Company



Researchers:

All the fine researchers throughout the US and in cooperating countries



Rethink Tomorrow

Nichino America, Inc.

novozymes®



Growers:

Who donate time to complete the biennial survey and all those plant materials!

IR-4 Personnel:

Michelle Foo

Mika Pringle-

Lori Harrison

Tolson

Edith Lurvey

Becky Sisco

Satoru Miyazaki

Ely Ve