

IR-4 New Products List

Compiled by IR-4 Project Headquarters

9/10/10

This *IR-4 New Products List* primarily contains brief descriptions of pest control products that have been introduced in recent years. It also contains information on some “older” crop protection chemicals that are believed to have potential for new uses for specialty crop growers. Many of these pest control tools offer promise to continue filling pest management voids created from cancellation of pesticides/pesticide uses associated with the Food Quality Protection Act and product reregistration reviews at EPA. A number of these products have been classified by the EPA as **Reduced Risk** for one or more uses, while others have characteristics that make them more desirable (i.e. **Organophosphate [OP] Replacement**) than some existing products. The usefulness of some products for specialty crops is still being explored. For information about registered, pending and potential future product uses requested by IR-4 specialty crop stakeholders, conduct a search of specific products on the IR-4 website (<http://ir4.rutgers.edu/>).

The information contained herein is to the best of our knowledge accurate, based on input from registrants and published literature. Consult product labels to confirm crops and use patterns that are registered. In addition to searching product labels on specific registrant websites, a good source for all product labels is the CDMS agrochemical database at www.cdms.net/labelsmsds/lmdefault.aspx?t; also, you can see EPA’s recently approved new uses by viewing the EPA work plan at www.epa.gov/opprd001/workplan/newuse.htm (both these websites appear as links on the IR-4 website by clicking on the “Food Crops” tab on the home page, then in the first column headed by “Food Crops Program Information” or on the “Related Links” page by clicking “Links” at the bottom of the home page).

If you see corrections that are needed in this document or if you have any questions on the material presented here, please contact Van R. Starner at IR-4 HQ, (starner@aesop.rutgers.edu or phone 732-932-9575 x4621).

Herbicides

Herbicides (TRADE NAMES)	Registrant(s)	Chemistry/Mode of Action	Pest Control Spectrum/Traits	Comments
AEB171509	Bayer Crop Science	Nitropyrazole, PPO inhibitor	Control of <i>Lamium</i> , <i>Stellaria</i> , <i>Viola</i> , and <i>Veronica</i> spp.	
<i>Alternaria destruens</i> (SMOLDER)	Loveland Products, Inc.	Microbial biopesticide, strain 059	Dodder (swamp, largeseed, field, smallseed)	Biopesticide – exempt from tolerance on all commodities
Ammonium pelargonate (RACER)	Falcon Lab. LLC	Ammonium salt of fatty acids	Broad spectrum, non-selective	Biopesticide
Aminopyralid (MILESTONE)	Dow AgroSciences	Pyridine carboxylic- amino analog of clopyralid-halopyridine	Broad spectrum	Reduced Risk Product
Amicarbazone (DINAMIC)	Arysta LifeSciences	Triazolinone	Soil and burndown activity is primarily on broadleaf weed species	
Bencarbazone (TM 435)	Bayer Crop Science; Arysta	Thioamide; triazolinone	Post-emergence control of broadleaf weeds in cereals, corn, sugar cane	
Beflubutamid (HERBAFLEX)	Ube Industries	Phenoxybutanamide (inhibits phytoene desaturase)	Post-emergence control of broadleaf weeds at rates of 170 to 255 g ai/ha (0.15 to 0.23 lb ai/A)	
Bensulfuron methyl (LONDAX)	DuPont Crop Protection	Sulfonylurea	Most broadleaf and sedge weeds	
Bispyribac sodium (REGIMENT)	Valent; K-I Chemical	Sulfonylurea (ALS Inhibitor)	Annual/perennial grasses and broadleaf weeds including herbicide resistant barnyardgrass	Candidate Reduced Risk Product
Catechin	Colorado State University	A component from spotted knapweed (<i>Centaurea maculosa</i>)	Controls many weeds	
Clodinafop-propargyl (DISCOVER)	Syngenta Crop Protection	Aryloxyphenoxy propionate (ACC ase)	Selective post-emergence of wild oats, annual grasses and other weeds	
Cloransulam-methyl (FIRSTRATE)	Dow AgroSciences	Sulfonamide (ALS inhibitor)	Pre-emergence or post-emergence to control annual broadleaf weeds	

IR-4 New Products List

9/10/10

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<i>Colletotrichum gloeosporioides</i> f. sp <i>malvae</i> (LOCK-DOWN)	Encore Technologies	Fungus	Pathogenic to round-leaved mallow, small flowered mallow, common mallow, velvetleaf, Northern joint vetch	Biopesticide
DE-742	Dow AgroSciences		Broad-spectrum graminicide	
<i>Drechslera monoceras</i> (MTB-951)	Certis		Barnyardgrass	Biopesticide
Flazasulfuron (MISSION) (KATANA)	ISK Biosciences	Sulfonylurea (ALS inhibitor)	Active against grasses and broadleaf weeds with pre- & post-emergence activity	Reduced Risk Product
Florasulam (PRIMUS) (BOXER)	Dow AgroSciences	Triazolopyrimidine sulfonanilide, (ALS inhibitor)	Provides post-emergence control of broadleaf weeds, particularly <i>Galium aparine</i> (Catchweed Bedstraw) at rates of 0.0045 to 0.0067 lb ai/A	
Fluazolate (JV 485)	Monsanto	Pyrazole benzoate	Pre-emergence control of broadleaf weeds and grasses	
Flucarbazone-sodium (EVEREST 70 WG)	Arysta LifeScience	Sulfonylaminocarbonyl-triazolinone,(ALS inhibitor)	Low rate post-emergence material that controls grass and certain broadleaf weeds	Reduced Risk Product
Flucetosulfuron	LG Lifesciences	Sulfonylurea (ALS inhibitor)	Highly effective on <i>Echinochloa spp.</i>	
Flumetsulam (BROADSTRIKE)	Dow AgroSciences	Sulfonamide (ALS inhibitor)	Controls broadleaf and grass weeds	
Flumiclorac-pentyl (RESOURCE)	Valent (Sumitomo Chemical)	N-phenylphthalimide derivative (PPO inhibitor)	Post-emergence control of velvetleaf and other broadleaf weeds	Reduced Risk Product
Flumioxazin (VALOR 50 WD) (CHATEAU 51 WDG)	Valent (Sumitomo Chemical)	N-phenylphthalimide derivative (PPO inhibitor)	Pre-emergence broadleaf herbicide with contact activity and residual soil activity	
Flupyr-sulfuron-methyl (LEXUS)	DuPont Crop Protection	Sulfonylurea (ALS inhibitor)	Selected broadleaf weeds, black grass, windgrass in cereals	
Fluthiacet-methyl (APPEAL) (BLIZZARD)	K-I Chemical; Chemtura	Prottox inhibitor	Post-emergence control for velvetleaf, lambsquarters and other broadleaf weeds	
Foramsulfuron (REVOLVER) (OPTION)* *Foramsulfuron plus safner	Bayer CropScience	Sulfonylurea (ALS inhibitor)	Post-emergence control of annual grasses (foxtails, barnyard, shatter cane, <i>Panicum</i> spp., crabgrass)	
Imazamox (RAPTOR)	BASF	Imidazolinone (ALS inhibitor)	Annual grasses and some broadleaf weeds	Reduced Risk Product; exempt from tolerance on all commodities
Imazosulfuron (V-10142)	Valent	Sulfonylurea (ALS inhibitor)	Controls problem broadleaf weeds, yellow/purple nutsedge, marehail; also suppresses annual grasses	Potential Methyl Bromide Alternative
Indaziflam (ALION)	Bayer CropScience	Alkylazine, cellulose-biosynthesis inhibitor	Submitted crops: citrus, grape, pome/stone fruit, tree nuts, pistachio, olive	will not fall within the triazine risk cup
Iodosulfuron-methyl sodium (HUSAR) (AUTUMN)	Bayer CropScience	Sulfonylurea (ALS inhibitor)	Early to mid-POST applications for control of grass and broadleaf weeds	

IR-4 New Products List

9/10/10

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IR6396	Isagro	PPO Inhibitor	Pre-emergence herbicide with good residual control of many glyphosate- and ALS-resistant weeds	
IR8116	Isagro	PPO Inhibitor	Pre-emergence herbicide with excellent residual control of many glyphosate- and ALS-resistant weeds	
Isoxaflutole (BALANCE)	Bayer CropScience	Isoxazole	Soil applied for many annual grasses and some broadleaf weeds	
Mesosulfuron-methyl (OSPREY) (SILVERADO) (MESOMAXX)	Bayer CropScience	Sulfonylurea (ALS inhibitor)	Early and mid post-emergence control of grasses and some broadleaf weeds	Reduced Risk Product
Mesotrione (CALLISTO)	Syngenta Crop Protection	Cyclohexanedione, (disrupts carotenoid biosynthesis)	Control of annual grasses and broadleaf weeds, including sulfonylurea resistant weeds	Reduced Risk Product
Metamifop	Dongbu Hannong	Aryloxyphenoxy propionate	Post-emergence herbicide for control of <i>Poa annua</i>	
Metosulam (BARKO)	Dow AgroSciences	ALS inhibitor	Preemergence control of broadleaf weeds	
Nicosulfuron (ACCENT)	DuPont Crop Protection; ISK; Cheminova	Sulfonylurea (ALS inhibitor)	Broadleaf weeds	
Orthosulfamuron (IR-5878) (STRADA)	Isagro	Sulfonylurea (ALS inhibitor)	Annual and perennial dicots and sedges	
Pelargonic Acid (SCYTHE)	Dow AgroSciences	Fatty acid	Contact, non-selective broad spectrum foliar applied material	Biopesticide
Penoxsulam (GRANATE) (GRASP)	Dow AgroSciences	Triazolopyrimidine sulfonamide (an ALS inhibitor)	Postemergence with soil residual activity; broad spectrum control of weeds including grass & sedge	Reduced Risk Product
Pethoxamid (SUCCESSOR 600)	Tokuyama	Acetamide	Selectively controls certain grasses and broadleaf weeds	
Pinoxaden (AXIL)	Syngenta Crop Protection	Phenylpyrazolin-inhibits fatty acid biosynthesis	Broad spectrum annual grass control	Reduced Risk Product
Prosulfuron (PEAK)	Syngenta Crop Protection	Sulfonylurea (ALS inhibitor)	Post-emergence for cocklebur, kochia, lambsquarter, pigweed, and velvetleaf	
Propoxycarbazone-sodium (OLYMPUS)	Bayer Crop Science	Sulfonylaminocarbonyl triazolinone (ALS inhibitor)	Bromus spp, grassy weeds and some weedy members of the cruciferous family	
Pyroxasulfone (KIH 485)	K-I Chemicals	Sulfonyloxazoline (VLCFAE inhibitor)	Controls many annual grasses when applied either pre- or post-emergence	
Pyroxulam (DE-742)	Dow AgroSciences	Triazolo-pyrimidine sulfonamide	Annual grasses and broadleaf weeds	
<i>Puccinia thlaspeos</i> (WOAD WARRIER)	Greenville Farms	Biological herbicide- Dyers Woad Rust	Specific to Dyer's Woad	
Pyraflufen-ethyl (ET)	Nichino America (Nihon Noyahku)	Protoporphyrin oxidase inhibitor	Post-emergence for non-selective control of weeds or use as desiccant	

IR-4 New Products List

9/10/10

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Pyrasulfotole (AE 0317309)	Bayer CropScience	Phenyl pyrazolyl ketone	Post-emergence control of broadleaf weeds in cereals	
Pyribenzoxium (PYANCHOR)	Dow AgroSciences; LG Chem	Benzophenone	Post emergence on numerous grasses, broadleaf & sedges	
Pyrimisulfan KIH-5996 KUH-021	KI Chemicals	Sulfonamide	Perennial weeds in rice	
Quizalofop-ethyl (ASSURE) (TARGA)	DuPont Crop Protection; Gowan	Phenoxy propionic ester	Post emergence grass herbicide	
Rimsulfuron (MATRIX)	DuPont Crop Protection	Sulfonylurea (ALS inhibitor)	Annual grass and broadleaf weeds	Methyl Bromide Alternative
S-Metolachlor (DUAL MAGNUM)	Syngenta Crop Protection	Chloracetanilide (single isomer of metolachlor)	Same spectrum as metolachlor (DUAL)	Reduced Risk Product
Saflufenacil (KIXOR herbicide family of products)	BASF	Amide/Uracil – PPO inhibitor	Dicot weeds, including those resistant to glyphosate- ALS-and triazine-resistant biotypes; uses on many crops	TREEVIX WG, INTEGRITY EC (pre- mix), SHARPEN SC, OPTILL WG (pre-mix)
Sulfentrazone (SPARTAN)	FMC	Aryl triazinone (PPO inhibitor)	Controls both broadleaf and grass species	
Sulfosulfuron (MAVERICK)	Monsanto	Sulfonylurea (ALS inhibitor)	Grasses/ broadleaf weeds including quackgrass, bromes and mustards	
SYN 523	Syngenta Crop Protection; Sumitomo Chemical		Broad spectrum burndown and residual activity at low rates	
Tembotrione (AE 0172747) (LAUDIS)	Bayer CropScience	Cyclohexanedione- HPPD inhibitor	Controls pigweed species (including water hemp, common lambsquarters, common ragweed, giant ragweed, Pennsylvania smartweed, common cocklebur, kochia giant foxtail, yellow foxtail, shattercane, barnyardgrass, large crabgrasses, and woolly cupgrass	
Tepraloxydim (EQUINOX)	BASF/Nisso	Cyclohexanedione, (ACCcase inhibitor)	Provides post-emergence grass weed control	
Thiencarbazone	Bayer			
TM 435	Arysta Lifescience	Aryl-triazolinone	Post emergence control of broadleaf weeds	
Tobacco Mild Green Mosaic Tobamovirus (SOLVINEX)	BioProdex, Inc	Microbial	Post emergent control of tropical soda apple	Biopesticide
Tropamezone (IMPACT)	AMVAC; BASF	Methanone – HPPD inhibitor	Major grass and broadleaf weeds including morningglory species, ragweed species, common sunflower, and kochia; grass weeds controlled at higher rates include barnyardgrass, goosegrass, giant foxtail, and crabgrass	
Tralkoxydim (ACHIEVE)	Syngenta Crop Protection	Cyclohexandione (ACCcase inhibitor)	Post-emergence for grass weeds such as wild oats, green and yellow foxtail, and annual ryegrass	Reduced Risk Product

IR-4 New Products List

9/10/10

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Triasulfuron (AMBER)	Syngenta Crop Protection	Sulfonylurea (ALS inhibitor)	Broadleaf weeds	
Tribenuron-methyl (EXPRESS)	DuPont Crop Protection	Sulfonylurea (ALS inhibitor)	Broadleaf weed	
Triflurosulfuron-methyl (UPBEET)	DuPont Crop Protection Cheminova	Sulfonylurea (ALS inhibitor)	Broadleaf weeds	
Trifloxysulfuron sodium (ENFIELD) (ENVOKE)	Syngenta Crop Protection	Sulfonylurea (ALS inhibitor)	Broadleaf weeds, including nutsedge, morningglory, hemp sesbania, sicklepod, cocklebur and pigweed	Methyl Bromide Alternative

Plant Growth Regulators

Plant Growth Regulators (TRADE)	Registrant(s)	Chemistry/Mode of Action	Pest Control Spectrum	Comments
<u>AMV-1018</u>	AMVAC	(3-decen-2-one)	Potato sprout inhibitor	Potential for use in organic production
<u>Bacillus cereus</u> Strain BP01	Microflo	Bacteria	Cotton in boll retention and size; also promotes increase in root mass, earlier fruit initiation and increased fruit retention	Biopesticide
Benzyladenine (PROMALIN) (MAXCEL)	Valent BioSciences	Benzylamicyo-purine	Produces typier larger fruit	Biopesticide
Clofencet (DETASSELOR)	Monsanto	Carboxylic acid	Hybridizing agent	
CMMP	FL Department of Citrus	Nitropyrole	Citrus abscission agent	
Diphenylamine	Syngenta Crop Protection	Diphenylamine	Protects the fruit from scald	
1,2,6-DIPN (AMPLIFY)	UAP/Platt	Diisopropyl naphthalene	Controls sprout on storage potatoes; works in synergy with CIPC	
Forchlorfenuron (PRESTIGE)	KIM-C1; Valent	Synthetic cytokinin - phenylurea	Influences fruit set, berry growth and development	
Gibberellic Acid (RELEASE) (PROVIDE)	Valent BioSciences	Mixtures of gibberellins	Differing activities on crops, depending on specific mixture of gibberellins and stage of target crop	Biopesticide
Glutamic Acid (AUXI GRO)	Emerald Bioagriculture	Gamma- amino butyric acid	Enhances crop growth and yield	
Harpin Protein (MESSENGER)	Eden Bioscience	Protein which switches natural plant systems	Enhance, fruit set, size and yield; also a disease resistance activator	Biopesticide

IR-4 New Products List

9/10/10

Plant Growth Regulators (TRADE)	Registrant(s)	Chemistry/Mode of Action	Pest Control Spectrum	Comments
LPE 94	NutraPark	Phospholipid	Ripening and shelf life enhancement	Biopesticide
MBTA (ECOLYST)		Substituted tertiary amine	Novel PGR that promotes sugar accumulation in processing oranges	Reduced Risk Product
1-methyl cyclopropene (SMART- FRESH)	AgroFresh Inc.	Cyclopropene	Inhibits the attachment of ethylene to ethylene receptor for a post-harvest storage extension	Reduced Risk Product.
Prohexadione Calcium (APOGEE)	BASF; K-I Chemical	Calcium carboxylate	Reduces vegetative growth-better balance between canopy development and fruit production; activity on fire blight on apple and pear	Reduced Risk Product
Sodium nitrophenolate (ATONIK)	Asahi Mfg. Ltd.	Combination of sodium nitrophenolates and nitroguatalolate	Increased nutrient uptake, resulting in improved yields	
Trinexapac-methyl (PALISADE)	Syngenta Crop Protection	Cyclohexane carboxylic acid	Growth regulator with use resulting in less potential for lodging, more efficient seed harvest, and improved seed set.	

IR-4 New Products List

9/10/10

Insecticides

Insecticides (TRADE)	Registrant(s)	Chemistry/Mode of Action	Pest Control Spectrum/Traits	Comments
Acequinocyl (KANEMITE) (SHUTTLE) (PITON)	Arysta LifeScience; Agro Kanesho	Quinolinone	Broad spectrum mite control (no rust mite activity); unique mode of action, asy on beneficials with long residual	Reduced Risk Product
Acetamiprid (ASSAIL 70 WP) (ADJUST)	Nisso/United Phosphorus, Inc.,	Chloronicotinyl	Broad-spectrum control with contact and systemic activity via foliar applications; excellent on sucking pests like aphids and whitefly	Reduced Risk Product and OP Replacement
Amdoflumet	Sumitomo Chemical (Valent)	Sulfonylamiino Benzoate	Mites	
Ammonium Bicarbonate with Spiroketal (OLIVE FLY ATTRACT & KILL)	Certis USA	Pheromone plus ammonium bicarbonate	Olive fruit fly	Registered on olive.
Azadirachtin (NEEMIX) (NIMBECIDINE)	Certis USA; PBT Int.; Gowan; AMVAC	Extract from neem oil which acts as a hormonal analogue	Disrupts insect molting; target pests include whitefly, leafminer, and Lepidoptera	Biopesticide
<i>Bacillus sphaericus</i> (VECTOLEX)	Valent BioSciences	Bacteria	Mosquito larval management	Biopesticide
<i>Bacillus thuringiensis</i>	Valent BioSciences; others	Bacteria	New strains are being discovered that have activity against numerous pests	Biopesticide
<i>Beauveria bassiana</i> (MYCOTROL) (NATURALIS)	Laverlam International; Troy Biosciences; others	Insect pathogenic fungi	Corn borer, grasshopper, cricket, locust, aphids and whitefly	Biopesticide
<i>Beauveria brongniartii</i>	German Gov.	Insect pathogenic fungi	Targeted for soil dwelling pests	Biopesticide
Bifenazate (ACRAMITE)	Chemtura	Carbazate - new mode of action with no cross resistance	Controls spider and European red mites, including eggs and motiles; provides quick knockdown, safe on predator mites	Reduced Risk Product
Bistrifluron (DBI-3204)	Dongbu Hannong Chemical	Benzoylphenyl urea	Active against lepidopterous pests, whitefly; acts by inhibiting chitin synthesis (Insect Growth Regulator)	
Buprofezin (APPLAUD) (COURIER)	Nichino America	Thiadiazine - IGR, unique mode of action, inhibits chitin synthesis	Good activity for nymphal stages of leafhoppers, planthoppers, scales, mealybugs, psylla, and whiteflies; very safe to bees	Reduced Risk and OP Replacement
California Red Scale Pheromone	HHB Partnership	Pheromone	California redScale	Biopesticide
CHECKMATE BAW	Suterra	Pheromone	Biochemical mating disruption for beet armyworm	Biopesticide
CHECKMATE CM-F	Suterra	Pheromone	Biochemical mating disruption for codling moth and hickory shuckworm	Biopesticide
CHECKMATE DBM--F	Suterra	Pheromone	Biochemical mating disruption for diamondback moth	Biopesticide
CHECKMATE OFM	Suterra	Pheromone	Biochemical mating disruption for Oriental fruit moth	Biopesticide
CHECKMATE OLR	Suterra	Pheromone	Biochemical mating disruption for omnivorous leaf roller	Biopesticide

IR-4 New Products List

9/10/10

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CHECKMATE PBW-F	Suterra	Pheromone	Biochemical mating disruption for pink bollworm	Biopesticide
CHECKMATE TPW	Suterra	Pheromone	Biochemical mating disruption for tomato pinworm	Biopesticide
<i>Chenopodium ambrosiodes</i> var. <i>ambrosiodes</i> extract	AgraQuest Inc.	Plant extract	Spectrum of activity includes mites, aphids, thrips, and whitefly	Biopesticide
Chlorantraniliprole (DPX-E2Y45) (RYNAXYPYR) (ALTACOR) (CORAGEN)	Dupont Crop Protection; Syngenta Crop Protection (mixtures only)	Anthranilic diamide: novel mode of action - ryanodine receptor activator	Excellent activity against a broad range of lepidopterous larvae	Reduced Risk Product/OP Replacement (DURIVO combo product w/thiamethoxam (veggies); VOLIAM xpress combo product w/lambda-cyhalothrin (veggies); VOLIAM flexi combo product w/thiamethoxam (pome/stone fruit, grape, potato))
Chromafenozide (MATRIC)	Nippon Kayaku; Sankyo	Insect Growth Regulator	Specific to lepidopterous pests, novel ecdysone agonist	
<i>Chromobacterium suttisuga</i>	USDA	Bacterium	Effective against Colorado potato beetles, corn rootworms, diamondback moths, whiteflies and green stinkbug	Biopesticide
<i>Chrysoperla carnea</i> (KAGETARO)	Arysta LifeScience	Bio-insecticide	Controls aphids	Biopesticide
Cinnamaldehyde (CINNACURE) (CINNAMITE)	Proguard	Natural Product	Aphids, mites and the diseases downy mildew, powdery mildew, botrytis, and brown rots	Biopesticide
Citronellol (BIOMITE)	Arysta Life Science; Natural Plant Protection	Combination product containing citronellol, geraniol, nerolidol and narnesol	Two-spotted mite, Pacific mite, Willamette mite, citrus rust mite, broad mite, European red mites	Biopesticide
Clofentezine (APOLLO)	Makhteshim-Agan	Tetrazine	Acaricide for eggs of <i>Panonychus ulmi</i> and <i>Tetranychus spp.</i>	Reduced Risk Product
Clothianidin (PONCHO) (CLUTCH)	Bayer CropScience (seed treatment only); Sumataka (Valent)	Neonicotinoid	Contact and stomach activity; when applied to soil there is activity on corn root worm, cutworms, wireworms, chinch bug, white grub and flea beetle; may be used with biotech rootworm hybrids; foliar activity on plum curculio, aphids, leafhoppers, apple maggot, leafminers, leaf rollers, codling moth, lygus bugs and pear psylla	Reduced Risk and OP replacement
Clove/Cinnamon/Mint Oils (VALORAM II) (ARMOREX II)	Soil Technologies Corp	Natural Product	Shown to contact kill and repel numerous insect pests	
Cyantraniliprole (CYAZYPYR) (HGW86)	DuPont; Syngenta Crop Protection	Anthranilic diamide-binds to the ryanodine receptor	Lepidoptera, flea beetles, whiteflies, leafminers, Colorado potato beetle, aphids	
<i>Cydia pomonella</i> granulose virus (CARPOVIRUSINE)	Arysta LifeScience; Biotepp; Certis USA	Granulosis virus	Controls codling moth	Biopesticide
Cyenopyrafen (NC-512)	Nissan Chemical	Miticide	Unspecified mites	
Cyenopyrafen NC 512	Canyon Group; Nissan	Acrylonitrile inhibits mitochondrial respiration	Spider and other mites	

IR-4 New Products List

9/10/10

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Cyflumetofen (BAS 9210I) (OK-5101) (DANISATABA)	BASF Otsuka Chemical	Benzoxycyanoacetate derivative - acaricide	Effective against <i>Tetranychus</i> and <i>Panonychus</i> mites on citrus, tree nuts, pome fruit, grapes, strawberry, tomato	Registered in Japan, Korea, Israel; submitted to Brazil and EU
Dinotefuran (VENOM 70SG) (STARKLE) (SCORPION) (ALBARIN)	Mitsui Chemical Valent Gowan	Nitroguanidine, systemic by root uptake and translaminar via foliar applications	Effective on aphid, thrips, leaf miners fly, cabbageworm, diamondback moth, stink bugs, mealybugs, whitefly, and flea beetle	Reduced Risk Product/OP Replacement
ESOSEX CM	Esosect	Pheromone	Codling moth	Biopesticide
ESOSEX GBM	Esosect	Pheromone	Grape berry moth	Biopesticide
ESOSEX TPW	Esosect	Pheromone	Tomato pin worm	Biopesticide
ESOSEX PTB	Esosect	Pheromone	Peach twig borer	Biopesticide
ESOSEX OFW	Esosect	Pheromone	Oriental fruit moth	Biopesticide
Essential Oils	Plant Impact	Vegetable oils-tagetes, thyme and wintergreen oils	Mites, aphids and other insects	Biopesticide
Ethoxy Dodecyl Phenol (EDP)	Cal Agri Products	Insect Growth Regulator	Aphids and whitefly	Biopesticide
Etofenprox (TREBON) (MTI-500)	Sipcam Advan Mitsui Chemical	Phenoxybenzyl ether	Broad spectrum: rice bugs, rice water weevil, leafhoppers, weevils, stink bugs, various Lepidoptera; broad label approved in Japan for rice, fruits, vegetables, ornamentals, wheat, soybean, potato, turf, termites, mosquitoes	Reduced Risk Product
Etoxazole (ZEAL) (S-1283)	Valent (Yashima)	Oxazoline – Insect Growth Regulator	Manages mites (<i>Panonychus spp</i> and <i>Tetranychus spp</i>) by inhibition of molting; effective on eggs, larvae, & nymphs stages	Reduced Risk Product
Fenazaquin	Gowan; Great Lakes	Insecticide		
Fenoxycarb (COMPLY)	Syngenta Crop Protection	Non-neurotoxic carbamate – Insect Growth Regulator	Fire ants and a wide range of other insects	
Fenpyroximate (FUJIMITE)	Nichino	Phenoxy-pyrazole	Controls mites, including two-spotted, European red and citrus rust and red mite, psylla and broad mites	Reduced Risk Product
Fonicamid (CARBINE 50 WG) (BELEAF)	FMC; ISK Biosciences	Pyridine carboxamide (nicotinamide)	Aphids, thrips, leafhoppers, plant bug and other sucking pests; provides rapid anti-feeding activity; non-toxic to beneficials	OP Replacement
Fluacrypyrin (TITARON)	Nippon Soda	Methoxyacrylate	Acaricide	
Flubendiamide (PHOENIX-JAPAN) (BELT) (SYNAPSE) (NAI-2310) (TOURISMO-NNI-0772*) (VETICA-NNI-0871*) (*mixed with buprofezin)	Bayer CropScience; Nichino	Substituted phthalic acid diamide; a novel biochemical mode of action – activates ryanodine receptor	Highly selective on Lepidopteran pests, adults and larvae, including cutworms, diamondback moth, <i>Helicoverpa</i> , leafrollers, loopers and armyworms; fast acting with residual control, by ingestion only; low toxicity to beneficials	
Flufenimer	Valent (Sumitomo Chemical)	Pyrimidinamine		
Flufenoxuron (CASCADE) (TENOPA)	BASF	Benzylurea		

IR-4 New Products List

9/10/10

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Flufenzine	Chinoïn	Tetrazine	Acaricide	
Flupyrzolos (SEON BONG)	Dongbu Hannong		Diamondback moth	
GALAXY V4C	Analytica	Viral Insecticide		Biopesticide
<i>Helicoverpa zea</i> Nuclear Polyhedrosis Virus (GEMSTAR)	Certis	Biopesticide	Controls corn earworm, cotton bollworm, tobacco budworm	Biopesticide
Indian Meal Moth Granulosis Virus (FRUITGUARD-V) (NUTGUARD-V)	AgriVir; LLC	Virus	Indian meal moth	Biopesticide
Isomate-CM/LR TT	Pacific Biocontrol Corp.	Pheromone	Lepidopteran pheromone used in orchards for mating disruption of codling and leafroller moths	Biopesticide
Iron Phosphate (SLUGGO)	W. Neudoff	Iron salt	Slugs and snails	Biopesticide
Jobba Oil (DETUR/E-RASE]	IJO Products	Natural Product	Controls whitefly and powdery mildew	Biopesticide.
Kaolin (SURROUND)	BASF	Clay	Various insect and mite pests	Biopesticide
Lepimectin (E-237) (ANIKI)	Sankyo Agro, Co., Ltd.	Chemically modified milbemectin macrolide	Highly effective against lepidopteran hemipteran and dipteran pests; should fit IPM programs	
ME5343	Meiji Seika Kaisha, Ltd.; BASF	New class of chemistry and new mode of action	Foliar, seed trt., and soil applied for aphids, whiteflies, some scales, mealy bugs, leafhoppers on fruits, vegetables, vines, row crops, ornamentals	Market launch expected 2014 in Japan, 2015 in US, EU, South America
<i>Metarhizium anisopliae</i> (TAERAIN) (GREENGUARD)	Earth BioScience; Bio-Care	<i>Metarhizium anisopliae</i>	Controls whitefly, thrips, mites, locust	Biopesticide
NNI-0771	Nichino			
Novaluron (DIAMOND) (RIMON) (PEDESTAL)	Makhteshim-Agan; Chemtura	Benzoylphenyl urea - Insect Growth Regulator (chitin synthesis inhibitor)	Effective against Lepidoptera, mealy bugs, silver leaf whitefly, Western flower thrips, leaf miners, and some mites; strictly a contact material	Reduced Risk Product and OP Replacement
<i>Paecilomyces fumosoroseus</i> Strain FE9901 (NOFLY)	FutureEco	Entomopathogenic fungi	Egg, larvae and adults of whitefly	Biopesticide
Parasitic Nematodes (NEMASYS)	Becker Underwood	Various parasitic nematodes that control specific insect pests	Manages fungus gnats, sciarid flies, vine weevil, slugs, cranberry girdler, leafminer	Biopesticide
PAVOIS Granulosis virus	Bayer CropScience	<i>Carpocapsa</i> spp.	Product controls two generations of susceptible insects	Biopesticide
<i>Paelomyces fumosoroseus</i> (PRE FER AL)	Biobest	Microbial	Whitefly	Biopesticide
Potassium Silicate	PQ Corpotation		Unspecified insects and mites	Biopesticide

IR-4 New Products List

9/10/10

Insecticides (TRADE)	Registrant(s)	Chemistry/Mode of Action	Pest Control Spectrum/Traits	Comments
Propylene glycol monolaurate (ACARITOUCH)	Toagosei Co., Ltd.; Otsuka Chemical Co., LTD	Miticide	Tetranychid mites, two-spotted spider mite, citrus mite; especially effective on mite eggs	
Pyrifluquinazon (NNI-0101)	Nichino	New mode of action, quinazolinone chemistry	Safe on beneficials, expected to reduce virus spread by white flies; is an insect behavior modifier; has spectrum of buprofezin plus aphids	
Pyrimidifen (MITECLEAN)	Sankyo Agro	MET inhibitor-ethylpyrimidine amine	Spider and rust mites	
Pyriproxyfen (KNACK) (DISTANCE) (ESTEEM) (SEIZE)	Valent (Sumitomo Chemical)	Pyridine (Insect Growth Regulator selective juvenile hormone analog)	Controls scales, whiteflies, thrips, pear psylla, codling moth, and ants; is slow acting with a long residual, safe to beneficial insects, non-toxic to man and wildlife; effective on eggs and immature stages, not effective on adults; excellent for IPM programs	Reduced Risk Product and OP Replacement
QCIDE	BioProspect	Plant derived biopesticide	Controls aphids, whitefly, spider mites, and mealybugs	
RED SCALE DOWN	HBB Partnership	Mating disruption pheromone	Red scale	Biopesticide
Rosemary Oil (HEXACIDE)	EcoSmart Technologies	Natural Product	Kills scale insects on contact, minimal impact on beneficials	Biopesticide
<i>Serratia entomophila</i> (BIOSHIELD)	Balance Agri-Nutrients	Bacterial based bio-insecticide	Grass grubs (<i>Costelytra zealandiia</i>)	
Sodium Metasilicate (TRIAD)	Environmental Safe Systems, Inc	Fused silicate	Suppression mealybugs and leafhoppers	Biopesticide
Spinetoram (XDE 175) (RADIANT) (DELEGATE)	Dow AgroSciences	Macrocyclic lactone – chemically modified second generation spinosads	Broader spectrum than spinosad, including codling moth, oriental fruit moth	Reduced Risk Product
Spinosad (SUCCESS) (SPINTOR) (ENTRUST ¹) (GF-120 ²) ¹ Organix formulation and certification ² Fruit fly bait	Dow AgroSciences	Macrocyclic lactone – mixture of Spinosyn A & D	Controls Coleoptera, Diptera, Hymenoptera, Isoptera, Lepidoptera, Thysanoptera, Siphonoptera, and mites; has low environmental impact, good residual activity, and is safe to many beneficial insects making it ideal for use in IPM programs	Reduced Risk Product and OP Replacement
Spirodiclofen (ENVIDOR 240 SC) (DANIEMON)	Bayer CropScience	Spirocyclic phenyl-substituted tetronic acid-ketoenols; inhibits lipid biosynthesis	Broad-spectrum activity against mites, psyllid, nymphs and scale crawlers; very active on eggs, larvae, and quiescent stages; safe on predatory mites/insects	
Spiromesifen (OBERON 2 SC)	Bayer CropScience	Spirocyclic phenyl-substituted tetronic acid-ketoenols; inhibits lipid biosynthesis	Effective against whitefly and mites; juvenile stages are more susceptible than adults	
Spirotetramat (BYI 8330) (MOVENTO)	Bayer CropScience	Spirocyclic phenyl-substituted tetronic acid-ketoenols; inhibits lipid biosynthesis	Aphids, whitefly, mealybugs, psyllids, Phylloxera, some scales, <i>Thrips tabaci</i> , other sucking insects; systemic activity	Reduced Risk Product
<i>Spodoptera exigua</i> Nuclear Polyhedral virus (SPOD-X)	Certis USA	Viral insecticide	Beet armyworm	Biopesticide

IR-4 New Products List

9/10/10

Insecticides (TRADE)	Registrant(s)	Chemistry/Mode of Action	Pest Control Spectrum/Traits	Comments
<i>Steinernema riobavis</i> (BIOVECTOR)	Becker Underwood	Nematode	Weevils	
<i>Streptomyces galbus</i> strain QST 6047	AgraQuest	Microbial	Control of lepidopterous pests	Biopesticide
Sucrose & Sorbitol Octanoate Esters	AVA Chemical Ventures	Biochemical sugar	Registered for mites, thrips, sciarid fly larvae, plant bugs, lace bugs, whitefly, aphids, leafhoppers, glassy-winged sharpshooter, soft scales, mealybugs	Biopesticide
Tebufenpyrad (PYRANICA) (MASAI)	UAP; Nichino America	Pyrazole carboxamide MET inhibitor	Broad spectrum miticide against all growth stages; good knockdown and residual activity; good fit into IPM programs	
Thiamethoxam (ACTARA) (PLATINUM) (CENTRIC) (CRUISER) (HELIX)	Syngenta Crop Protection	Second-generation neonicotinoid; systemic in plant by root uptake and transport in xylem	Broad-spectrum activity against soil dwelling, sucking and some chewing pests; effective against aphids, whitefly, thrips, leafhopper and certain beetles; being marketed for seed, soil and foliar treatments	OP Replacement (DURIVO combo product w/chlorantraniliprole (veggies); VOLIAM flexi combo product w/chlorantraniliprole (pome/stone fruit, grape, potato); ENDIGO ZC combo product w/lambda-cyhalothrin (various crops))
Thiocyclam (EVISECT)	Arysta LifeScience; Nippon Kayaku	Hydrogen oxalate	Coleopteran and lepidopteran insects	
Thymol (API LIFE VAR)	Bushy Mountain Bee Farm; Vita Limited	Thyme oil	Used to control varroa mites on bees	Biopesticide
Tolfenpyrad (HACHI) (OMI-88) (NAI-2302/NAI-2303)	Nichino America (Nichino)	Pyrazole - Carboxamide	Effective against diamondback moth, thrips, aphid, other leps, whitefly, homopterans, coleoptera; suppresses spider mites and powdery mildew; active also on pear psylla, pear rust mite, citrus rust mite	Reduced Risk Product
<i>Verticillium lecanii</i> (MYCOTAL)	Arysta LifeScience	Bio-insecticide	Effective against whitefly	Biopesticide
VIROSOFT Viral Insecticide	Biotepp	<i>Mamestra configurata</i> Granulosis virus	Can be applied as a preventative treatment at planting or a curative foliar treatment for bertha armyworm	Biopesticide

IR-4 New Products List

9/10/10

Fungicides

Fungicides (TRADE)	Registrant(s)	Chemistry/Mode of Action	Pest Control Spectrum/Traits	Comments
Acibenzolar (ACTIGARD) (BLOCKADE)	Syngenta Crop Protection	Benzothiadiazole, (Systemic Acquired Resistance [SAR] inducer)	Induces resistance to tomato spotted wilt virus, blue mold, bacterial diseases, downy mildew, <i>Sclerotinia</i>	
<i>Agrobacterium radiobacter</i> (GALLTROL-A)	AgBioChem	Bacteria	Control of hairy root and root mat, crown gall	Biopesticide
<i>Ampelomyces quisqualis</i> isolate M-10 (AQ 10)	Certis USA	Fungus	Hyperparasite of powdery mildew	Biopesticide
AgroGuard Z	Bio-Oz Biotechnologies Ltd	Viruscide	Zucchini yellow mosaic virus	Biopesticide
Ametoctradin (ZAMPRO) (ORVEGO)	BASF	Triazolopyrimidine class	Wide range of crop uses	Submitted to EPA 3/2010
Amisulbrom (NC-224)	Nissan Chemical	Sulfonamide - inhibit fungal respiration	Oomycete diseases, downy mildew, late blight	
<i>Aspergillus flavus</i> AF 36	USDA	Fungus	Competitive inhibition of aflatoxin production by natural <i>Aspergillus</i> strain	Biopesticide
<i>Aspergillus flavus</i> (AFLA-GUARD)	Circle One Global	Fungus	Competitive inhibition of aflatoxin, production by natural <i>Aspergillus</i> strain	Biopesticide
<i>Bacillus pumilus</i> Strain 2808 (SONATA ASO) (BALLARD)	AgraQuest	Microbial	<i>Botrytis</i> , <i>Phytophthora</i> , downy and powdery mildews, rusts, <i>Sclerotinia</i> blight, and rots	Biopesticide
<i>Bacillus pumilus</i> -GB 34 (YIELD SHIELD)	Gustafson	Microbial	Suppression of <i>Rhizoctonia</i> & <i>Fusarium</i> as seed treatment	Biopesticide
<i>Bacillus subtilis</i> Strain QST 713 (SERENADE) (SERENADE ASO)	AgraQuest	Microbial - protectant with SAR activity	Controls <i>Botrytis</i> , powdery and downy mildews, early blight, bacterial spot, fire blight	Biopesticide
<i>Bacillus subtilis</i> var. <i>amyloliquefaciens</i> Strain FZB24 (TAEGRO)	Earth Bioscience	Microbial		Biopesticide
<i>Bacillus subtilis</i> Strain D-747	Kumiai	Microbial	<i>Botrytis</i>	Biopesticide
<i>Bacillus subtilis</i> Strain GB03	Growth Products Ltd	Microbial		Biopesticide

IR-4 New Products List

9/10/10

Fungicides (TRADE)	Registrant(s)	Chemistry/Mode of Action	Pest Control Spectrum/Traits	Comments
<i>Bacillus subtilis</i> Strain MB 1600 (SUBTILEX)	Becker Underwood	Microbial	Seed treatment use	Biopesticide
Bacteriophages (AGRIPHAGE)	Agriophi		Manages bacteria spot and bacteria speck	Biopesticide
Benoximate	Bayer CropScience	Strobilurin		
Benthiavalicarb (KIF-230)	K-I Chemical/Kumiai Chemical	Amino acid carbamate	Controls downy mildew and oomycete fungi, including <i>Phytophthora capsici</i> (both preventive and curative activity)	
<i>Candida saitoana</i> (BIOCURE)	Micro Flo	Biofungicide	Post-harvest disease control in fruits, both preventative and curative activity	Biopesticide
Chitosan (ELEXA-4)	SafeScience	Carbohydrate-chitin based product, plant defensive booster	Downy and powdery mildew, grey mold and <i>Botrytis</i>	Biopesticide
Cinnamaldehyde (CINNACURE) (CINNAMITE)	Proguard	Natural Product	Downy mildew, powdery mildew, botrytis, brown rots, aphids and mites	Biopesticide
<i>Coninthyrium minitans</i> (CONTANS WG)	Prophyta; Encore Technologies	Fungus	Controls <i>Sclerotinia sclerotiorum</i> and <i>S. minor</i>	Biopesticide
Copper Octanoate (NEU 1140F)	W. Neudorff	Copper octanoate	Downy mildew, powdery mildew, blue mold, white rust, anthracnose	
Cyazofamid (RANMAN)	ISK Biosciences; FMC	Phenylimidazole –mitochondrial transport inhibitor	<i>Phytophthora, Plasmopara, Pythium, Pseudoperonospora,</i> <i>Plasmoidiphora</i>	Reduced Risk Product
Cyflufenamid (NF-149) (TORINO) (PANCHO)	Nisso America (Nippon Soda) Gowan	Phenylacetamid	Excellent activity on various powdery mildews and brown rots	
Cymoxanil (CURZATE)	DuPont Crop Protection	Acetamide	Downy mildew, late blight, <i>Phytophthora, Plasmopara,</i> <i>Pseudoperonospora, Albugo</i>	
Cyproconazole (ALTO)	Syngenta Crop Protection	Triazole – contact and systemic activity	Powdery mildew, white mold, <i>Septoria</i> , rusts	
Cyprodinil (VANGARD)	Syngenta Crop Protection	Anilinopyrimidine	Ascomycetes and Deuteromycetes such as: <i>Botrytis, Alternaria,</i> <i>Monilinia, Venturia, Pyrenophora, Septoria, Erysiphe,</i> <i>Colletotrichum</i>	Reduced Risk Product
Diallyl Sulfide (ALLI-UP)	UAP/Platt	Biochemical	White rot	Biopesticide
Dimethomorph/ Pyraclostrobin (BAS 536)	BASF	Combination of cinnamic acid derivative and strobilurin	Dimethomorph spectrum (see above) plus <i>Alternaria,</i> <i>Anthracnose, Septoria, Cercospora</i>	
Dithianon (DELAN)	BASF	Dicarbonitrile	Scab, downy mildew, rust, leaf spot	
Enestroburin SYP-Z071	Shenyang Research	Strobilurin	Novel strobilurin fungicide, with similar control spectrum as with dimethomorph and azoxystrobin; some activity on lepidopteran pests	
Ethaboxam (GUARDIAN)	LG Life Science Ltd.	Thiazole carboxamide	Useful for downy mildew, and blights; has preventive and curative activity	

IR-4 New Products List

9/10/10

Fungicides (TRADE)	Registrant(s)	Chemistry/Mode of Action	Pest Control Spectrum/Traits	Comments
Famoxadone (FAMOXATE) (EQUATION) (CONTACT) (TANOS*) *with Cymoxanil	DuPont Crop Protection	Oxazolidinedione	Broad-spectrum fungicide, including early blight, downy mildews and other ascomycetes; can be combined with cymoxanil to pick up late blight; famoxadone may suppress some bacterial diseases	Reduced Risk Product
Fenamidone (REASON)	Bayer CropScience	Imidazolinone (respiration inhibitor)	Foliar protectant and curative activity against Oomycete fungi; also effective against ascomycete and <i>Alternaria</i> ; inhibits electronic transport	Reduced Risk Product
Fenhexamid (ELEVATE)	Arysta LifeScience	Metraoxycyclohexame carboxamidehHydroxyanilide class	Non-systemic protectant fungicide effective against <i>Botrytis cinerea</i> , <i>Monilinia</i> , <i>Sclerotinia sclerotiorum</i> of lettuce	Reduced Risk Product
Fluazinam (OMEGA)	Syngenta Crop Protection; ISK Bioscience	Pyridinamine	Broad spectrum disease control: <i>Alternaria</i> , <i>Botrytis</i> , <i>Cladosporium</i> , <i>Colletotrichum</i> , <i>Phytophthora</i> , <i>Plasmopara</i> , <i>Rhizoctonia</i> , <i>Sclerotinia</i> , <i>Venturia</i> , <i>Streptomyces</i> , and some mites	Reduced Risk Product
Fludioxonil (MAXIM) (SCHOLAR) (CANNONBALL)	Syngenta Crop Protection	Phenylpyrrole	<i>Fusarium</i> , <i>Helminthosporium</i> , <i>Rhizoctonia</i> , <i>Aspergillus</i> , <i>Alternaria</i> , <i>Ascochyta</i> , <i>Sclerotinia</i> , <i>Septoria</i>	Reduced Risk Product
Flumorph SYP-L190	Shenyang Research	Cinnamic acid derivative	Effective against oomycete fungi, including downy mildew and <i>Phytophthora</i>	
Fluopicolide (INFINITO) (RELIABLE*) *premix with Propamocarb HCL	Valent (Sumitomo Chemical); Bayer CropScience	Acylpicolides, a new chemistry & mode of action with translaminar and xylem systemic properties; effects several life cycle stages	Oomycetes - downy mildew, late blight, <i>Phytophthora</i> , <i>Pythium</i> , <i>Plasmopara</i> , <i>Peronospora</i> , <i>Pseudoperonospora</i> and <i>Bremia</i>	
Fluopyram	Bayer Crop Science	Benzamide	Very active on Botrytis and powdery mildew.	
Fluoxastrobin (EVITO) (DISARM-in turf)	Arysta LifeScience	Strobilurin	<i>Alternaria</i> , early blight and <i>Sclerotinia</i> ; can be used as seed treatment or foliar use	
Flusilazole (FUSION)	Dupont Crop Science	Triazole	Asian soybean rust	
Flusulfamide (NEBIJIN) (SCABLOCK)	Mitsui Chemical	Sulfonanilide	Manages clubroot disease (<i>Plasmodiophora brassica</i>) in Brassica	
Flutolanil (CONVOY)	Gowan; Nichino America	Benzanilide	Rusts, sheath blight, and other diseases caused by <i>Rhizoctonia</i>	
Flutriafol	Cheminova	Triazole	Asian soybean rust, powdery mildews, apple scab, other diseases	
Fluxapyroxad (XEMMIUM – combo with pyraclostrobin)	BASF	Carboxamide	Leaf spots, powdery mildew, rusts, scab, Botrytis, Sclerotinia, Monilinia on fruits, vegetables, row crops	Expect registration 2012
Fosetyl-AL (ALIETTE)	Bayer CropScience	Aluminum phosphonate	Controls <i>Phytophthora</i> diseases, <i>Alternaria</i> diseases and downy mildew	

IR-4 New Products List

9/10/10

Fungicides (TRADE)	Registrant(s)	Chemistry/Mode of Action	Pest Control Spectrum/Traits	Comments
Glutamic Acid (AUXI GRO)	Emerald Bioagriculture	Glutamic acid	Controls brown rot and suppresses shot hole	Biopesticide
<i>Gliocladium catenulatum</i> Strain J1446 (PRESTOP) (SOILGUARD)	Kemira Agro; Certis USA	Fungus	Recommended for control of <i>Pythium</i> and <i>Rhizoctonia</i>	Biopesticide
GX569 (KOCIDE 3000)	Dupont	Copper-based		
Harpin Protein (MESSENGER)	Eden Bioscience	Protein which switches natural plant defenses in plant	Bacterial leaf spot wilt, blight, and fungal diseases such as botrytis, bunch rot, and powdery mildew	Biopesticide and Methyl Bromide Replacement
Hydrogen peroxide (OXIDATE)	Bio Safe Systems	Hydrogen peroxide	Broad spectrum bactericide and fungicide	
Hymexazol (TACHIGAREN)	Sankyo Agro	Azole	Effective against <i>Aphanomyces</i> , <i>Pythium</i> , <i>Fusarium</i> , <i>Corticium</i>	Reduced Risk Product
Iminoctadine Albesilate (BELLKUTE)	Nisso America (Nippon Soda)	Alkylbenzene sulfonate	<i>Botrytis</i> , <i>Anthracnose</i> , <i>Penicillium</i> , grey mold	
Ipconazole (VORTEX)	Chemtura ; Bayer CropScience ; Kureha	Triazole	Protects against seed borne and soil borne fungi, which causes seed decay, damping off, and seedling blight	
Iprovalicarb (MELODY)	Bayer CropScience	Amino acid amide	Early and late blight, downy mildew	
Isopyrazam (BONTIMA)	Syngenta Crop Protection	Single site MOA – respiration inhibitor, benonorbene chemistry	Key strengths – Septoria, rusts, ramularia in barley; broad spectrum disease control for fruits, vegetables, cereals; initial EU launch on cereals; mainly protectant, but some curative action	
Isotianil	Bayer CropScience	Anilide		
Kasugamycin (hydrochloride) (KASUMIN) (TM 416)	Arysta LifeScience; Hokko	Aminoglycoside antibiotic from <i>Streptomyces kasugaensis</i> – inhibition of protein synthesis	A product with preventative and curative action on bacteria (<i>Pseudomonas</i> , <i>Erwinia</i> and <i>Agrobacterium</i>), <i>Xanthomonas</i>	
Kiralaxyl IR6141, IRF060 (FANTIC, SIDECAR, STADIO, CAPRI)	Isagro	Nucleic RNA-polymerase inhibitor	<i>Phytophthora</i> , <i>Plasmopara</i> , <i>Bremia</i> and <i>Pythium</i> spp; systemically active	
Laminarin (IODUS 40)	Goemar	Oligosaccharide	It acts as a disease resistance activator on a wide range of pathogens including <i>Septoria</i> spp	Biopesticide
Mandipropamid (REVUS) (REVUS TOP [with difenoconazole])	Syngenta Crop Protection	Carboxylic acid amide- binds with wax layer in plant tissue, forming a protective barrier against fungal establishment.	Targets Oomycetes (except <i>Pythium</i>) - <i>Phytophthora</i> blight, late blight, downy mildews	Reduced Risk Product
Mepanipyrim (FRUPICA) (COCKPIT) (TD-2448)	KI Chemical	Anilinopyrimidine	Controls <i>Botrytis</i> , scab (<i>Venturia</i> spp.) and powdery mildew; mostly a preventive material but has curative properties; unique mode of action/no cross-resistance	
Metconazole (CARAMBA) (OPERETTA)	BASF; Valent; Kureha	Triazole	<i>Septoria</i> , powdery mildew, <i>Alternaria</i> , <i>Cercospora</i> , <i>Fusarium</i> , rusts	

IR-4 New Products List

9/10/10

Fungicides (TRADE)	Registrant(s)	Chemistry/Mode of Action	Pest Control Spectrum/Traits	Comments
Metrafenone (FLEXITY) (VIVANDO)	BASF	Benzophenone – new mode of action; acts on germination process, germ tubes and hyphal growth	Compound confers preventive, curative and antisporeulant properties on powdery mildew	
<i>Muscodor albus</i> Strain QST 20799 (ARABESQUE) (PIROUETTE) (GILSSADE)	AgraQuest	Biofungicide	Fungus produces volatile compounds that are effective against plant pathogens and bacteria	Biopesticide and potential Methyl Bromide Alternative
NAI-4201	Nichino	Natural product	Fireblight, other bacterial diseases	
NAI-4203	Nichino	Bactericide	Fire blight, other bacterial diseases	
<i>Pantoea agglomerans</i> C9-1	Nufarm	Bacteria	Fire blight	Biopesticide
<i>Pantoea agglomerans</i> E-325	Northwest Agriculture Products	Bacteria	Fire blight	Biopesticide
Penflufen (BYF14182)	Bayer Crop Science	Alkylamide; a succinate dehydrogenase inhibitor	For seed treatment uses (alfalfa, tuberous/corm vegetables, legumes, wheat, barley, corn, rice, oil seeds, cotton), and potato in-furrow	Submitted 12/09 for global review
Penthiopyrad (MTF 753) (LEM 17)	Mitsui Chemicals, Inc.; DuPont	Carboxamide	Activity on strobilurin and DMI resistant diseases (grey mold, powdery mildew, apple scab, rusts, <i>Rhizoctonia</i> , <i>Botrytis</i> , etc.)	
Peroxyacetic Acid	Ecolab Inc.	Peroxyacetic acid	Post harvest decay and rot	
Phosphonic Acid (FOLI-R-FOS) (AGRI-FOS)	Wilbur-Ellis Fluence	Phosphorus acid	Downy mildew, scab, and root rot	
Physpe (VACCIPLANT)	Agrimar		Bacterial diseases	Biopesticide
Picoxystrobin (Acanto)	DuPont Crop Protection	Strobilurin		
Polyoxin D zinc salt (ENDORSE) (VERANDA)	Arysta LifeScience	Allofuranuronic acid; chitin inhibitor, derived from the streptomycin group of fungi-use rate may be limited to 6.2 oz. prod/A	Foliar and translaminar activity against <i>Alternaria</i> , <i>Botrytis</i> , powdery mildew, leaf spots, <i>Rhizoctonia</i> , <i>Anthraco</i>	Biopesticide (potential OMRI listing)
Potassium Bicarbonate (KALIGREEN) (ARMICARB) (MILSTOP)	Arysta LifeScience; Church & Dwight; BioWorks	Inorganic salt	Powdery mildew, cercospora leaf spot, blossom rot	Biopesticide
Potassium Dihydrogen Phosphate (eKsPunge) (KDP)	Lido Chemical; Cal Agri Products	Potassium dihydrogen phosphate	Powdery mildew	
Potassium Phosphite (PRO-PHYT)	Pamol	Potassium Phosphite	Downy mildew, late blight and root rots	
Propamocarb Hydrochloride (PREVICUR FLEX)	Bayer CropScience	Carbamate – systemic root uptake & acropetal distribution throughout the plant	Downy mildew, late blight, <i>Pythium</i> , <i>Phytophthora</i> , and <i>Aphanomyces</i> ; should be mixed with other fungicides for resistance management	

IR-4 New Products List

9/10/10

Fungicides (TRADE)	Registrant(s)	Chemistry/Mode of Action	Pest Control Spectrum/Traits	Comments
Proquinazid (DPX-KQ926)	DuPont Crop Protection	Quinazolinone	Powdery mildew - extended residual disease control for four to six weeks	
Prothioconazole (PROLINE) (PROVOST)	Bayer CropScience	Triazolinthone-demethylation inhibitor	<i>Ascochyta</i> , <i>Puccinia</i> , <i>Septoria spp</i> , <i>Sclerotonia</i> , <i>Fusarium spp</i> , rusts and <i>Rhizoctonia</i> as seed trt or foliar with protectant, curative & eradicate activity	
<i>Pseudomonas chloroaphis</i> Strain 63-28 (AtEze)	EcoSoil Systems	Bacteria	Target pest include soil borne diseases <i>Rhizoctonia solani</i> and <i>Pythium spp</i> ; outcompetes phytopathogenic species	Biopesticide
<i>Pseudomonas fluorescens</i> PRA-25	Good Bugs, Inc.	Bacteria	Controls <i>Pythium</i> seed rot and damping off	Biopesticide
<i>Pseudomonas syringae</i> (BIOSAVE)	EcoScience	Bacteria	Controls <i>Fusarium</i> and post harvest storage rots	Biopesticide
<i>Pseudozyma flocculosa</i> Strain PF-A22 (SPORODEX WP)	Plant Products Ltd.	Bacteria	The product antagonizes a number of powdery mildew species	Biopesticide
Pyribencarb (KIF 7767) (KUF-1204)	Kumiai Chemical; Ihara Chemical; K-I Chemicals	Mitochondrial electron transport inhibitor	Gray molds, Botrytis, stem rots	
Pyrimethanil (SCALA) (PH-066)	Bayer CropScience; Janssen	Anilinopyrimidine	Active against <i>Botrytis spp.</i> , <i>Venturia spp.</i> , <i>Alternaria solani</i> , <i>Alternaria mali</i> , <i>Sphaerotheca macularis</i> and <i>Monilinia spp.</i>	Reduced Risk Product
Quinoxifen (QUINTEC)	Dow AgroSciences	Quinoline - disrupts early cell signaling activities	Activity against powdery mildew	Reduced Risk Product
<i>Reynoutria sachalinensis</i> (MILSANA Bioprotectant)	KHH BioScience	Extract from giant knotweed	Induces phytoalexins that confer resistance to powdery mildew, <i>Botrytis</i> , bacterial blight	Biopesticide
Saponins of <i>Chenopodium quinoa</i>	Headsup Plant Protectants			
SA-110201	Sipcam		Oomycetes, including a high level of efficacy particularly against <i>Phytophthora</i>	
Simeconazole (SANLIT) (MONGARIT)	Sankyo Agro	Triazole	Effective as seed treatment against Basidiomycetes	
Silthiophan (LATITUDE)	Monsanto	Carboxamide	Control of Take-All via seed treatment	
Sodium Metasilicate (TRIAD)	Environmental Safe Systems, Inc.	Fused silicate	Suppression of powdery mildew	Biopesticide
<i>Streptomyces griesoviridis</i> (MYCOSTOP)	AgBio Inc.	Bacteria	Damping off/root rots caused by <i>Fusarium</i> , <i>Pythium</i> , <i>Alternaria</i> and other pathogens	Biopesticide
<i>Streptomyces lydicus</i> (ACTINOVATE)	Natural Industries	Bacteria	Soil borne diseases	Biopesticide
<i>Streptomyces lydicus</i> WYEC 108 (ACTINOVATE)		Bacterium	Control of soil borne plant root and damping off fungi	Biopesticide
Sulfur dioxide (UVASYS SO ₂ releasing pad)	Tedmark	Sulfur dioxide gas	Active against Botrytis and other post-harvest fungi	

IR-4 New Products List

9/10/10

Fungicides (TRADE)	Registrant(s)	Chemistry/Mode of Action	Pest Control Spectrum/Traits	Comments
SYP-Z048	Shenyang Research		Active against Ascomycete, Basidiomycete and Deuteromycete fungi	
Tetraconazole (EMINENT 125SL) (DOMARK) (METTLE)	Valent; Sipcam Advan; Isagro	Triazole	Foliar diseases including <i>Cercospora</i> , <i>septora</i> , powdery mildew and others	
TF-991	Sumitomo Chemical (Valent)	Sulfonamide		
Thyme Oil (PROUD)	Bio Huma Netics	Natural Product	Foliar fungicide that control a broad spectrum of fungal diseases	Biopesticide
Tolnifanide	Sumitomo (Valent)		Alternaria blotch	
Tiadanil	Nichino	SAR compound	Fire blight	
<i>Trichoderma harzianum</i> T-39/(TRICHODEX) T-22 (ROOTSHIELD)	Makhteshim-Agan and Bioworks	Fungi	Controls <i>Botrytis</i>	Biopesticide
<i>Trichoderma harzianum</i> <i>Rafai strain KRL-AG2</i> (PLANTSHIELD)	Bioworks Inc.	Fungi	Controls <i>Botrytis</i>	Biopesticide
<i>Trichoderma asperellum</i> & <i>T. gamsii</i> (REMEDIER) (TENET)	Isagro; Sipcam Advan	Mixture of conidiospores of two selected <i>Trichoderma</i> strains	Colonizes the rhizosphere and the soil thereby competing for nutrients and moisture	Biopesticide
Triflumizole (PROCURE) (TERRAGUARD)	Nisso & Chemtura	Imidazole	Powdery mildew, rusts, apple scab, <i>Rhizoctonia</i> , <i>Cylindrocladium</i> , <i>Thielaviopsis</i> , <i>Myrothecium</i> , <i>Alternaria</i> , <i>Helminthosporium</i> , <i>Ramularia</i>	
Triticonazole (CHARTER)	BASF	Triazole	Used as a seed treatment against smut, common bunt and soil borne seed rots	
V-10135	Valent	New chemistry & different mode of action	Effective on <i>Botrytis</i> , <i>Monilinia</i> , <i>Sclerotinia</i> and other fungi as preventive and curative treatment; has translaminar activity	
Valifenalate (IR5885) (VALIS) (YABA)	Isagro	Carboxylic acid amide	Oomycete diseases (late blight and downy mildew)	
Yeast Extract Hydrolysate (KeyPlex 350)	Morse Enterprises	Natural product: extract from <i>Saccharomyces</i>	Prevents bacterial leaf spot disease of tomatoes, post-bloom fruit drop and greasy spot diseases of citrus	Biopesticide
ZONIX	Jeneil Biosurfactant	Rhamnolipid biosurfactant	Manages downy mildew, <i>Pythium</i> and <i>Phytophthora</i>	Biopesticide.

IR-4 New Products List

9/10/10

Nematicides

Nematicides (TRADE)	Registrant(s)	Chemistry/Mode of Action	Pest Control Spectrum	Comments
AJ 1629	Ajay SQM	Iodine Complex	Nematodes and soil borne fungal pathogens	Potential Methyl Bromide Alternative
AKD-3088	Agro Kanesho	Organophosphate nematicide		
<i>Bacillus firmus</i> (BIONEM) (BIOSAFE)	Minrav Infrastructurer	Bacterial nematicide	Controls root knot and other nematodes including <i>Heterodera avenae</i>	
DMDP	BTG	Derived from <i>Lonchocarpus felipei</i>	DMDP is phloem mobile, making it suitable for foliar applications	Biopesticide
Dimethyl disulfide (PALADIN)	Arkema, Inc.; UPI	Soil fumigant based on DMDS, a substance derived from sulfur	Broad spectrum fumigant effective against nematodes, weeds and soil-borne plant pathogens; registered on tomato, pepper, eggplant, cucumber, melon, strawberry, ornamental and forest nursery crops	Methyl Bromide Alternative; registered as a food additive in US and EU
Fosthiazate (NEMATHORIN)	Syngenta; ISK Bioscience	Lower risk organophosphate	Controls nematodes	Partial Methyl Bromide Alternative
Harpin Protein (N-HIBIT)	Eden Bioscience	Biopesticide	Root knot nematode	
Imicyafos (NEMAKICK) (AKD-3088)	Agro Kanesho	Phosphonothioate (OP)	Non-fumigant that is effective against root-knot, root lesions, cyst nematodes; high contact activity and fast diffusion in soil	Potential Partial Methyl Bromide Alternative
Iodomethane (MIDAS)	Arysta LifeScience	Methyl Iodide	Similar to Methyl Bromide – soil fumigant	Methyl Bromide Alternative (federal label October 2007)
IRF135	Isagro		Initial work showed excellent activity against emerged nutsedge and excellent control of Fusarium	Potential biological fumigant
MCW-2	Makhteshim Agan North America	Fluensulfone nematicide; mode of action unknown	Southern/northern root-knot, potato cyst, sting and sugarcane nematodes; possibly others	

IR-4 New Products List

9/10/10

Nematicides (TRADE)	Registrant(s)	Chemistry/Mode of Action	Pest Control Spectrum	Comments
<i>Muscodor albus</i> Strain 20799 (ARABESQUE) (ANDANTE) (GLISSADE)	AgraQuest	Fungus		Biopesticide and Potential Methyl Bromide Alternative
<i>Myrothecium verrucaria</i> strain AARC-0255 (DITERA)	Valent BioSciences	Biopesticide	Controls root knot, cyst, lesion, citrus, stubby root, pin, reniform, dagger, sting, ring, stunt, lance, spiral, burrowing and others	Partial Methyl Bromide Alternative.
<i>Paecilomyces lilacinus</i> Strain 251 (BIO ACT) (MELO-CON WG)	Prophyta & Gustafson	Fungus	Controls burrowing, root knot and cyst nematodes	Biopesticide
<i>Pasteuria penetrans</i>	Pasteuria Bioscience	Parasitic bacterium	Root knot nematode	Biopesticide
PROPOXIDE	Aberco	Propylene oxide	Fumigant for stored nuts and spices. Potential for soil uses	Potential Methyl Bromide Alternative.
Sodium Azide (SEP-100)	American Pacific	Sodium azide	Many pests that are currently controlled by methyl bromide	Potential Methyl Bromide Alternative
Sodium lauryl sulfate (PFA 2000)	Acme International	Biochemical	Wide spectrum material including anti-fungal properties	Potential Methyl Bromide Alternative
Sodium Tetrathiocarbonate (ENZONE)	Helena	Sodium tetrathiocarbonate (carbon disulfide generator)	Water-soluble soil fumigant for management of, plant parasitic nematodes, various soil borne pathogens and other soil pests	Potential Methyl Bromide Alternative
TERRAPY	Cognis Deutschland	Fatty acid preparation in alkyl(poly)glycoside	Shown to significantly reduce <i>Meloidogyne</i> infestations	Biopesticide
Thiazosulfene (MCW2) (Supporter) (Namer)	Makhteshim-Agan; SDS Biotech	Fluoroalkenyle (thioether) – Kill nematodes through contact	Highly effective on root-knot nematodes (<i>Meloidogyne</i> spp.); also targets <u>Rhadopholus</u> spp. and <u>Pratylenicus</u> spp.	

Other Types of Pest Control Products

Chemical (TRADE)	Registrant(s)	Chemistry/Mode of Action	Pest Control Spectrum/Traits	Comments
9-10 Anthraquinone (AVIPEL)	Arkion	Natural Product	Goose and other bird repellent	
Methyl Anthranilate (BIRD SHIELD)	Becker Underwood; Bird Shield Repellent Corp	Methyl anthranilate	Bird repellent	