

WASHINGTON AGRICULTURAL CHEMICAL USAGE 2003 Fruit Crops



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General

Chemical usage data for selected Washington fruit crops are presented in the accompanying releases. These data are the results of the Fruit Chemical Usage Survey that was conducted in the fall of 2003. This survey was designed to collect data on pesticides applied to selected fruit crops in 2003. A sampling of producers in major fruit growing states, across the United States, was chosen to establish the estimation base. The probability nature of the survey allowed for estimates that are representative of chemical use on all targeted fruits in each of the participating states. Survey results include estimates of the percent of area treated, number of applications, rates per application, rates per crop year, and total pounds of chemical applied. Data are summarized for the active ingredients of pesticides and other chemicals applied. Pesticide data were collected for specific formulations of trade name products and then converted to active ingredients. Therefore, the estimates associated with a particular active ingredient may represent applications of several trade name products. Pesticide application rates also reflect partial coverage applications as a result of band, spot, and alternate row spraying techniques. This survey excludes any chemical treatments applied to the fruit after harvest. Data on fertilizer applications were collected during the 2003 Fruit Chemical Usage Survey, but were not collected in 2001. Chemical use information for fruits is collected in odd numbered years, while vegetables are collected in even numbered years.

Targeted crops in Washington included apples, pears, sweet cherries, grapes, and raspberries. Chemical use releases for all five crops surveyed in Washington, and crops surveyed in other states, are available upon request or via the Internet. Thanks are given to the many Washington fruit producers and contractors who provided the information summarized in these reports. Detailed reports, such as these, would not be possible without their voluntary cooperation.

Terms and Definitions

Active ingredient refers to the mechanism of action in pesticides which kills or controls the target pests. Usage data are reported by pesticide product and are converted to an amount of active ingredient. A single method of conversion has been chosen for active ingredients having more than one way of being converted. For example, in this report, copper compounds are expressed in their metallic copper equivalent, and others such as 2,4-D and glyphosate are expressed in their acid equivalent. **Allelopathic** is the release of chemical compounds from a plant that will inhibit the growth of another plant, such as weeds.

Agricultural chemicals refer to the active ingredients in fertilizers and pesticides. **Pesticides** include any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant. Pests targeted by pesticides include weeds, insects, fungi, and other forms of life.

Herbicides, insecticides, fungicides, and other chemicals make up the four classes of pesticides presented in this report. Miticides and nematicides are included as insecticides, while soil fumigants, growth regulators, defoliants, and desiccants are included as other chemicals. This report excludes pesticides used for seed treatments and for post-harvest applications to the commodity.

Bearing acres is the area of fruit, nut, berry, and vine crops that have reached a commercially productive bearing age. This age varies by crop, area, and producer. **Nonbearing acres** is the area of young plants that are considered by a grower to have not yet reached a commercially productive age. **Crop year** refers to the period immediately following harvest of the previous crop through harvest of the current crop.

Application rates refers to the average number of pounds of a fertilizer primary nutrient or pesticide active ingredient applied to an acre of land in one application. The rate reflects the effect of band, spot, or alternate row middle spraying. **Rate per crop year** is the average number of pounds applied of an ingredient to one acre of land over the entire crop year, counting multiple applications. **Number of applications** is the average number of times a treated acre received a specific primary nutrient or active ingredient. **Area applied** represents the percent of crop acres receiving one or more applications of a specific primary nutrient or active ingredient. This report does not contain **acre treatments**. However, acre treatments can be calculated by multiplying acres planted by the percent of area applied and the average number of applications.

Trade name is a trademark name given to a specific formulation of a pesticide product. A formulation contains a specific concentration of the active ingredient, carrier materials, and other ingredients such as emulsifiers and wetting agents. Some formulations as in the case of pre-mixes, can contain more than one active ingredient. **Common name** is an officially recognized name for an active ingredient.

Class, Common Name, and Trade Name

The following is a list of the common name, associated class and trade name of active ingredients in this publication. The classes are herbicides (H), insecticides (I), fungicides (F), and other chemicals (O). This list is provided as an aid in reviewing pesticide data. Pre-mixes are not cataloged. The list is not complete for all pesticides used on fruit crops, and NASS does not mean to imply the use of the specific trade name.

CLASS	COMMON NAME	TRADE NAME
H	2, 4-D	Amine 4, Citrus Fix (EC), Crossbow, Dacamine 4D, DriClean, Envy, Formula 40, Hi-Dep
H	2, 4-D, Dimethylamine salt	Saber Herbicide, Weedar 64, Weedaxe Herbicide
H	2, 4-DP, Dimethylamine salt	2, 4-D Amine 4CA
I	Abamectin	Agri-Mek, Clinch Ant Bait, Zephyr
I	Acephate	Address 75 WSP, Orthene 75 S, Orthene TT&O WSP
I	Acetamiprid	Assial 70 WP
H	Aciflourfen, sodium salt	Conclude Xtra B&G, Manifest B&G, Tackle (2L)
O	Aluminum phosphide	Fumitoxin Tablets (55%), Phostoxin
I	Amitraz	Mitac EC, Mitac WP, Ovasyn (1.5L)
H	Atrazine	Simazat 4L
I	Azadirachtin	AZA-Direct, Azatin XL, Azatin-EC Biological Insecticide, Bollwhip 4.5, Ecozin, Margosan-
I	Azinphos-methyl	Azinphos-M, Guthion
F	Azoxystrobin	Quadris (aka Abound)
F	Bacillus subtilis	Serenade Biofungicide (WP)
I	Bacillus thuringiensis	Agree, Bactoxpeine, Biobit, Britz BT 15-25 Sulfur Dust, Bt-Sulfur 15-50 Dust, Condor,
F	Basic copper sulfate	Basic Copper Sulfate, C-O-C-S, Cop-O-Zinc, Copper Dragon Bug & Blight Dust, CSC Sulfur Dust, Nu-Cop, Nutra-Spray, Nutra-Spray Copper Bordeaux, Top Cop with Sulfur
I	Beauveria bassiana	Mycotrol, Naturalis T&O
F	Benomyl	Benlate, Benomyl WP
H	Bentazon	Manifest, Conclude Xtra B&G
I	Benzoic acid	Intrepid
O	Benzyladenine	Accel, Perlan, Promalin, Typy
I	Bifenazate	Acramite
I	Bifenthrin	Brigade, Capture
I	Buprofezin	Applaud, Courier
O	Butenoic acid hydrochloride	Retain
F	Calcium polysulfide	Lime Sulfur Solution, Orthorix Spray, Sulforix
F	Captan	Agway Fruit, Captan
I	Carbaryl	Agway Fruit Tree Spray, Carbaryl, Copper Dragon Bug & Blight Dust, Sevin
I	Carbofuran	Furadan 15G, Furadan 4F
O	Carbon	Gas Cartridge Rodenticide, The Giant Destroyer
F	Carboxin	Vitavax-200
H	Carfentrasone-ethyl	AIM, Aim EC, Aim EW/ Avalanch, Aim
O	Chlorophacinone	Rozol (Pellets), Rozol (Liquid), Double
O	Chloropicrin	Chloropicrin 100, Methyl Bromide, Telone
F	Chlorothalonil	Bravo, Daconil, Echo, Ensign, Ridomil, Terranil
I	Chlorpyrifos	Chlorpyrifos, Lorsban, Nufos
I	Clarified hydrophobic neem oil	Triact, Trilogy
H	Clethodim	Conclude, Prism
I	Clofentezine	Apollo
F	Copper (metallic)	Bordeaux, C-O-C-S 3 Dust
F	Copper ammonium complex	Copper-Count-N
F	Copper chloride hydroxide	Agra-cop, Microperse
F	Copper hydroxide	Blue Shield, Champ, Champion, Coppercide, Kocide, Kop-Hydroxide, Mankocide, Nu-Cop
F	Copper oxide	Nordox
F	Copper oxychloride	C-O-C-S, CSC Copper Sulfur Dust
F	Copper oxychloride sulfate	C-O-C-S, Oxycop
F	Copper resinate	Camelot, Copper Fungicide, Tenn-Cop
F	Copper sulfate	Basicop, Copper Sulfate
I	Cryolite	Cryolite, Kryocide
O	Cyanamid	Dormex
I	Cydia Pomonella Granulovirus	Carpovirusine, CYD-X
I	Cyfluthrin	Baythroid, Renounce
F	Cyprodinil	Switch, Vanguard
O	Cytokinins	Cytokin Bioregulator Concentrate, Foliar Trigger, Stimplex, Symspray
O	DNOC	Elgetol (Thinner)
O	Decenol	Checkmate
O	Decenyl acetate	Checkmate
I	Diazinon	Diazinon, D-264 EC500, D-z-n Diazinon, Knox out, Spectracide
H	Dichlobenil	Casoron
O	Dichloropropene	Telone
F	Dicloran	Botran
I	Dicofol	Dicofol, Kelthane
H	Difenzoquat	Average
I	Diflubenzuron	Dimilin, Micromite
I	Dimethoate	Cygon, Digon, Dimethoate
O	Diphacinone	Diphacinine, Ramik
H	Diuron	Direx, Diurin, Karmax, Krovar, Surefire Herbicide
O	Dodecanol	Isomate
F	Dodine	Dodine, Syllit

CLASS	COMMON NAME	TRADE NAME
O	E, E-8, 10-Dodecadien-1-ol	Checkmate, Disrupt, Isomate, Lastcall, Nomate, Puffer CM, (Paramount) / (Suterre)
O	E-8-Dodecenyl acetate	Checkmate, Concep OFM Spr2m Pheromone Sprayable, Isomate
H	EPTC	Eptam
I	Endosulfan	Endocide, Endosulfan, Phaser, Thiodan, Thiodan Hi-Yield Insect Spray, Thiosulfan
I	Esfenvalerate	Asana
O	Ethephon	Ethephon, Ethrel Plant Regulator
I	Ethion	Ethion 4 Miscible
H	Ethofumesate	Norton SC Flowable Herbicide
I	Ethyl parathion	Parathion, Parathion-Methyl Parathion, Phoskil 25 Spray (WP)
I	Fenamiphos	Nemacur
F	Fenarimol	Rubigan
F	Fenbuconazole	Enable, Indar
I	Fenbutatin-oxide	Vendex
F	Fenhexamid	Decree, Elevate
H	Fenoxaprop-ethyl	Puma
I	Fenpropathrin	Danitol
F	Ferbam	Carbamate, Ferbam, Ferbam Granuflo
H	Fluazifop-P-butyl	Fusilade
F	Fludioxonil	Switch
F	Flutolanil	Moncut
I	Fonofos	Dyfonate II 10-G
I	Formetanate Hydrochloride	Carzol SP
F	Fosetyl-al	Aliette
O	Gibberellic acid	Falgro, Gibbex, GibGro, Pro-Gibb, Provide Plant Growth Regulator, Ryzup
O	Gibberellins A4A7	Accel, Fascination Plant Growth Regulator, Perlan, Promalin Plant Growth Regulator, TypRus, Typy
H	Glufosinate-ammonium	Ignite, Rely
H	Glyphosate iso. salt	Accord, Clear-out, Cornerstone, Engame, Fire Power, Glyfos X-tra, Glyphomax, Glyphosate Original, Gly Star Plus, Honcho, Jury, Landmaster, Mirage, Protocol, Rattler, Roundup
O	Harpin protein	Messenger
H	Hexazinone	Velpar
I	Hexythiazox	Savey
O	Hydrogen peroxide (dioxide)	Oxidate
I	Imidacloprid	Admire, Merit, Provado
I	Indoxacarb	Avaunt
F	Iprodione	Iprodione, Rovral
O	Iron phosphate	Sluggo
H	Isoxaben	Gallery
I	Jojoba Oil	Detur
I	Kaolin	Surround
F	Kresoxim-methyl	Sovran
O	L-Glutamic acid	Auxigro
O	Lactic acid	Propel Plant Growth Regulator
H	Lactofen	Phoenix Herbicide
I	Lambda-cyhalothrin	Olive, Warrior
I	Lindane	Lindane
H	MCPA	Weedar
I	Malathion	Agway Fruit Tree Spray, Atrapa, Cythion, Fyfanon, Malathion, Ortho Home Orchard Spray
O	Maleic hydrazide	Fair Plus, Royal
F	Mancozeb	Dithane, Mancozeb, Manex II, Mankocide, Penncozeb, Ridomil Gold MZ
F	Maneb	Amazin, Blite Out, Dithane, Maneb, Manex
F	Mefenoxam	Flourish Ultra, Ridomil, Subdue
O	Mepiquat	Ponnax Growth Regulator
F	Metalaxyl	Ridomil
O	Metaldehyde	Deadline, Metaldehyde, Slug and Snail Bait Pellets
O	Metam-sodium	Sectagon, Vapam
I	Methidathion	Supracide
I	Methomyl	Lannate
I	Methoxychlor	Agway Fruit Tree Spray, Malathion Methoxychlor Spray, Ortho Home Orchard Spray
O	Methyl anthranilate	Bird shield, Rejex-it
O	Methyl bromide	Methyl Bromide
I	Methyl parathion	Methyl Parathion, Parathion-Methyl Parathion
F	Methiram	Blite Out, Polyram
O	Monocarbamide dihyd.	Engame, Enquik, Wilthin
F	Myclobutanil	Nova, Rally, RH-144228
I	Myrothecium verrucaria	Ditera Biological Nematicide
O	NAD	Amid-Thin W
I	Naled	Dibrom 8 Emulsive / Miscible
O	Naphth. acetic acid. pot. salt	Fruit-fix, SNAAP
H	Napropamide	Devrinol
O	Napthaleneacetic acid	Fruit-fix, Fruitone, Kling Tite, Liqui-Stix, NAA, Stop Drop, Tre-Hold Sprout Inhibitor
I	Neem oil	NeemGard
H	Norflurazon	Predict, Solicam
O	Octadecadien (E,Z)	Isomate-P Pheromone
O	Octadecadien (Z,Z)	Isomate
H	Oryzalin	Oryza, Oryzalin, Surflan

CLASS	COMMON NAME	TRADE NAME
I	Oxamyl	Vydate
H	Oxyfluorfen	Fire Power, Goal
F	Oxytetracycline	Mycoshield
I	Oxythioquinox	Morestan
H	Paraquat	Cyclone, GramoxoneSuper, Starfire, Surfired
H	Pendimethalin	Pendimax, Prowl
I	Permethrin	Ambush, Eight Insect Control, LastCall, Permethrin, PermUp or Waylay, Pounce
I	Petroleum distillate	Clean Crop Citrus Soluble Oil, Damoil, Dormant Emulsion Oil, FC (Petroleum Oil), Gavicide
I	Petroleum oil	Biocover, Damoil Dormant Oil Spray, Mite-e-Oil
I	Phosalone	Zolone
I	Phosmet	Imidan
I	Phosphamidon	Phosphamidon 8 Spray
F	Phosphorous acid	Fosphite Fungicide, Phophyt, Phostrol
I	Piperonyl butoxide	Evergreen, Incite, PBO-8, Pyrenone, Pyronyl, Pyrocide Emulsifiable
F	Potassium Bicarbonate	Armcarb, Kaligreen
I	Potassium salt	M-Pede, Insecticidal Soap
O	Prohexadione calcium	Apogee Plant Growth Regular
H	Prometryn	Caparol, Cotton-Pro
H	Pronamide	Kerb
H	Propanil	Propanil 3E
I	Propargite	Comite, Omite
F	Propiconazole	Orbit, PropiMax, Tilt
H	Prosulfuron	Peak
F	Pseudomonas fluorescense	Blight Ban, Frostban
F	Pyraclostrobin	Cabrio, Headline
I	Pyrethrine	Evergreen, Pyrellin, Pyrenone, Pyrocide, Pyronyl
I	Pyridaben	Nexter, Pyramite, Sanmite
I	Pyriproxyfen	Esteem, Knack
I	Rotenone	Pyrellin E.C.
I	Ryania	Ryan
H	Sethoxydim	Manifest, Poast, Torpedo Herbicide, Vantage
H	Simazine	Calibar, Princep, Simazine, Slim-Trol, Simazat Bleach, Liquichlor.
O	Sodium hypochlorite	Bleach, Liquichlor
O	Sodium nitrate	Gas Cartridge Rodenticide, The Giant Destroyer
O	Sodium tetrathiocarb	Enzone
I	Soybean oil	Golden Citrus Natur'l Spray Oil
I	Spinosad	NAF-550 Fruit Fly Bait, GF-120 Naturalyte Fruit Fly Bait, SpinTor, Success, Tracer
F	Streptomycin	Agri-Mycin, Agri-Strep, Streptomycin
F	Streptomycin sulfate	Streptomycin sulfate
O	Strychnine	Cooke Gopher, Gopher Getter, Strychnine
H	Sulfosate	Touchdown
F	Sulfur	Alfa, Ben-Sul, Bravo, Britz BT, Botran, Bt-sulfur, C-O-C-S, CSC, Giant Destroyer, Golden- Dew, Kocide, Kolodust, Kolospray, Kumulus, Microfine, Microperse, Mecrothiol, RH-144228, Sulfur
F	Tebuconazole	Elite
I	Tebufenozide	Confirm, RH-5992
H	Terbacil	Sinbar
O	Tetradecanol	Isomate-C Pheromone/Special/TT
O	Tetradecen-1-OL (Z)	3M Pheromone-Mating Disruption, Checkmate, Isomate, Nomate OLR Spiral
O	Tetradecen-1-yl (E)	Checkmate, Nomate
I	Thiamethoxam	Actara, Centric
H	Thiazopyr	Mandate
F	Thiophanate-methyl	3336 G, T-Methyl, Topsin
F	Thiram	Thiram, Vitavax
F	Triadimefon	Bayleton
I	Trichlorfon	Dylox
H	Triclopyr	Crossbow, Remedy
F	Trifloxystrobin	Flint, Gem
F	Triflumizole	Procure
H	Trifluralin	Treflan, Trifluralin, Trilin
F	Triforine	Funginex
F	Vinclozolin	Ronilan
O	Warfarin	Raze Rat & Mouse Bait
O	Z-8-Dodecanol	Checkmate, Consep, Isomate
O	Z-8-Dodecenyl acetate	Checkmate, Consep, Isomate
O	Zinc phosphide	Zinc phosphide
F	Zineb	Zineb
F	Ziram	Ziram