

CALIFORNIA MANDARIN/MINNEOLA PRODUCTION*

COMMON TREATMENTS		
PEST/DISEASE TARGET	PEST CONTROL OPTIONS	TREATMENT PERIOD
Plant Growth Regulators	2,4-D	September-November
	gibberellic acid (GA ₃)	Mandarin - 1 to 2 applications from 50% petal fall up to 3 weeks after petal fall. Mandarin - 2 weeks before color break for late harvested orchards only as color should not be expected until late January with treatment.
Alternaria rot (<i>Alternaria</i> spp.)	Synthetic fungicides-azoxystrobin (Abound), azoxystrobin-difenoconazole (Quadris Top), boscalid-pyraclostrobin (Pristine), fluopyram-trifloxystrobin (Luna Sensation), fluopyram-trifloxystrobin (Priaxor), polyoxin-D (Ph-D)	October - February
Brown rot (<i>Phytophthora</i> spp.)	Copper compounds and synthetic compounds-fluopicolide (Presidio), mandipropamid (Revus), oxathiapiprolin (Orondis), and phosphonate fungicides (fosetyl-AI) including the biopesticide potassium phosphite (Prophyt, Fungi-Phite, etc.)	November - March
Clear rot (<i>Penicillium</i> spp.)	Synthetic fungicides-azoxystrobin (Abound), Azoxystrobin-difenoconazole (Quadris Top), pyrimethanil (Scala)	October - February
Gray mold (<i>Botrytis cinerea</i>)	Synthetic fungicides - pyrimethanil (Scala), boscalid-pyraclostrobin (Pristine), fluopyram-trifloxystrobin (Luna Sensation), fluxapyrad-pyraclostrobin (Priaxor), polyoxin-D (Ph-D)	October - February
California Red Scale	<i>Aphytis melinus</i> Releases * *	February– September
	oils, pyriproxyfen (Esteem), buprofezin (Centaur), spirotetramat (Movento)	May-Sept
Citrus Red Mite	oils, pyridaben (Nexter), acequinocyl (Kanemite), fenpyroximate (Fujimite), spiroadiclofen (Envidor), hexythiazox (Onager), cyflumetofen (Nealta)	Feb-Apr and September-October
Citrus Thrips	Spinosad (Success/Entrust), abamectin (Agri-Mek and others), beta cyfluthrin (Baythroid), cyfluthrin (Tombstone and others), fenpropathrin (Danitol), spinetoram (Delegate), Cyantraniliprole (Exirel), Minecto Pro (mixture of cyantraniliprole and abamectin)	April-June
Citricola Scale	oils, acetamiprid (Assail), imidacloprid (Admire and others), thiamethoxam (Actara), buprofezin (Centaur), flupyrifurone (Sivanto), tolfenpyrad (Bexar)	August-October
Forktailed bush Katydid	dimethoate, beta cyfluthrin, cyfluthrin, fenpropathrin (Danitol), diflubenzuron (Micromite), cryolite (Kryocide)	April-June

Asian citrus psyllid	Fenpropathrin, beta cyfluthrin, cyfluthrin, zeta-cypermethrin (Mustang), imidacloprid, thiamethoxam, pyrethrins, Spinosad, spirotetramat, spinetoram, flupyrifidifurone	Jan-Dec (except April)
Fuller rose beetle	Thiamethoxam, carbaryl (Sevin), cyantraniliprole (Exirel), tolfenpyrad	July and October
OCCASIONAL TREATMENTS		
Caterpillars (citrus cutworm, amorbia and others)	B.T.	April-June
Cottony Cushion Scale	Vedalia Beetle Establishment, * *	February-April
	malathion, carbaryl, methidathion	April-September
Citrus leafminer	Systemic imidacloprid, abamectin, spinetoram	June-October
Glassy-winged Sharpshooter	imidacloprid, acetamiprid, cyantaniiprole	March-August
	Acetamiprid, beta cyfluthrin	October-January
POST-HARVEST TREATMENTS		
DISEASE TARGET	DISEASE CONTROL OPTIONS	TREATMENT PERIOD
Green Mold & Blue Mold (<i>Penicillium digitatum</i> & <i>P.italicum</i>)	Synthetic compounds - σ -phenylphenol (OPP), thiabendazole (TBZ), imazalil (Deccocil, Freshgard), fludioxonil (Graduate), fludioxonil-azoxystrobin (Graduate A+), pyrimethanil (Penbotec), propiconazole (Mentor), natural compounds/biopesticides - carbonates (Soda Ash, Baking Soda), natamycin (BioSpectra), and biocontrols - <i>Pseudomonas syringae</i> (BioSave 10)	Pre-packaging of harvested fruit
Sour Rot (<i>Geotrichum.citri-aurantii</i>)	Synthetic fungicides (o-phenylphenol, propiconazole) and natural compounds/biopesticides – carbonates (Soda Ash, Baking Soda), natamycin (BioSpectra)	Pre-packaging of harvested fruit (Seasonal)
Gray mold (<i>Botrytis cinerea</i>)	Synthetic fungicides - fludioxonil (Graduate), fludioxonil-azoxystrobin (Graduate A+) and natural compounds/biopesticides - natamycin (BioSpectra)	Pre-packaging of harvested fruit (Seasonal)
Mucor rot (<i>Mucor</i> spp.)	Natural compounds/biopesticides - natamycin (BioSpectra)	Pre-packaging of harvested fruit (Seasonal)

* The only pesticides used by California citrus growers are ones that have been approved by the U.S. Environmental Protection Agency (EPA) and the California Department of Pesticide Regulation.

* * Beneficial insects are a key component in the California orange growers IPM program.