

CALIFORNIA NAVEL ORANGE PRODUCTION *

COMMON TREATMENTS

PEST/DISEASE TARGET	PEST CONTROL OPTIONS	TREATMENT PERIOD
Plant Growth Regulator	2,4-D	September-January
	Gibberellic acid (GA ₃)	Navel: Sep-Nov Valencia: Aug-Sep
Disease Control	Seasonal copper phosphonate compounds, biofungicides and synthetic fungicides are available for brown rot; copper for Septoria spot, and synthetic fungicides are available for all other fungal diseases.	October-November
Alternaria fruit rot	Synthetic fungicides-azoxystrobin (Abound), azoxystrobin-difenoconazole (Quadris Top), boscalid-pyraclostrobin (Pristine), fluopyram-trifloxystrobin (Luna Sensation), fluopyram-trifloxystrobin (Priaxor), polyoxin-D (Ph-D)	October-November (synthetic fungicides), seasonal)
Anthraco nose	Synthetic fungicides – azoxystrobin (Abound), azoxystrobin-difenoconazole (Quadris Top), boscalid-pyraclostrobin (Pristine), fluopyram-trifloxystrobin (Priaxor)	October-November (synthetic fungicides), seasonal)
Brown rot	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.)	October-November (copper and synthetic fungicides)
Clear Rot (Penicillium spp.)	Synthetic fungicides-azoxystrobin (Abound), Azoxystrobin-difenoconazole (Quadris Top), pyrimethanil (Scala)	Preharvest
Septoria spot	Copper compounds and synthetic fungicides – azoxystrobin (Abound), azoxystrobin-difenoconazole (Quadris Top), boscalid-pyraclostrobin (Pristine), fluopyram-trifloxystrobin (Luna Sensation), fluxapyrad-pyraclostrobin (Priaxor), polyoxin-D (Ph-D)	October-November (copper and synthetic fungicides)
California Red Scale	<i>Aphytis melinus</i> releases**	February– September
	Petroleum and mineral oils, pyriproxyfen (Esteem), buprofezin (Centaur), spirotetramat (Movento)	May-September
Citricola Scale	oils, acetamiprid (Assail), buprofezin (Centaur), imidacloprid (Admire and others), thiamethoxam (Actara), flupyrifurone (Sivanto), tolfenpyrad (Bexar)	August-September
Citrus Red Mite	Oils, pyridaben (Nexter), acequinocyl (Kanemite), fenpyroximate (Fujimite), spiroadiclofen (Envidor), hexythiazox (Onager), cyflumetofen (Nealta)	Feb-April 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
Forktailed Bush Katydid	dimethoate beta cyfluthrin, fenpropathrin (Danitol), diflubenzuron (Micromite), cryolite (Kryocide)	April-June
Fuller rose beetle	Thiamethoxam, carbaryl (Sevin), cyantraniliprole (Exirel)	Jul and Oct

Asian citrus psyllid	Fenpropathrin, beta cyfluthrin, cyfluthrin, zeta-cypermethrin (Mustang), thiamethoxam, imidacloprid, pyrethrins, spinosad, spirotetramat, spinetoram, flupyrifidifurone, tolfenpyrad	Jan-Dec (except April)
OCCASIONAL TREATMENTS		
Caterpillars (citrus cutworm, amorbia and others)	B.T.	March-June
Citrus leafminer (new plantings)	Systemic imidacloprid, abamectin, spinetoram	Aug-Oct
Cottony Cushion Scale	Vedalia Beetle Establishment,**	February-April
	malathion, carbaryl	April-September
Glassy-winged Sharpshooter	Imidacloprid, acetamiprid cyantraniliprole	February-August
	Acetamiprid, beta cyfluthrin	October-Jan
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)

* The only pesticides used by California citrus growers are ones that have been approved by U.S. and California regulators.

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