Data Requirements to be provided by the exporting country for undertaking Pest Risk Analysis

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1. Information on the crop

Scientific Name
Vaccinium Corymbosum L
Common Name
Blueberry
Varieities/cultivars Name (characteristics & pest/disease susceptibility)

The following varieties are the typical fresh-crop blueberries. Typically, varieties are planted for timing for fresh market "windows." For India, we are planning late crop varieties to suite the later part of August, and September.

Duke	Early. Bush is open, stocky, multicaned and upright. Vigorous, very productive. Fruit is large size, light blue, firm, mild flavor.	No special susceptibility to pests or diseases.
Bluecrop	Midseason. Upright, vigorous bush, very productive. Fruit is light blue, very large, small scar, very firm, flavorful when ripe, won't crack or drop.	No special susceptibility to pests or diseases.
Elliot	Very late. Upright, vigorous, excellent bush shape. Heaviest producer of medium size, powder blue, very firm, slightly tart berries. Small, dry scar.	No special susceptibility to pests or diseases.
Legacy	Late midseason, after second pick Bluecrop.	No special susceptibility to pests or diseases.

	Upright, open, vigorous to 6-7 ft. Berries medium size, light blue, very firm, superior scar and flavor	
Berkeley		

Export Market Preferences: Our experience with Indian consumers in England have shown that they prefer large berries as well as mild sweet berries.

2. Production Area

Principal growing areas
(States/Regions/districts)
Although highbush blueberries are produced in 38 states and two provinces of Canada, our intent is to seek access only for states that are west of the Rocky Mountains.

- California,
- Pacific Northwest states of the USA as well as British Columbia, Canada
    - Oregon
    - Washington State
    - British Columbia, Canada

These regions are the main supply regions of fresh blueberries for Japan, Taiwan and Southeast Asia and are close to main air hubs for shipping, are free from any insects or any phytosanitary concerns. In the 1980's the Japanese government conducted extensive testing and procedures to evaluate any risk caused by US or Canadian blueberries and concluded that there were none whatsoever. In the past decade, Japan has import more than 1,000 metric tons of fresh blueberries from the Pacific Northwest each year and has experienced no problems whatsoever. The Rocky Mountains, which divide the country in two serve as a natural barrier from any pests from other regions of the country and all states and provinces in the West maintain either embargoes on importation of fruits from pest areas and have extensive check points at state lines.

Area Maps (general/enlarged)

California:
California is a new producing region of the USA, and production has developed specifically for the fresh blueberry market

using new varieties that thrive in hot temperatures. The main growing regions of California are the Central Valley, specifically, San Joaquin, Fresno, Tulare and Kern Counties. California produces from May to July, and has concluded its harvest this year. We would like to ship fresh blueberries from California in the next harvest of May to July 2008.

Oregon:

The state of Oregon is a major blueberry producing region and most cultivation is in the Willamette Valley which is south of Portland near Salem. Production begins in June and runs until September. Oregon growers have successfully shipped fresh blueberries to Japan for the past decade. Oregon is the home to the Oregon State University (OSU) and the North Willamette Research Station which is one of the centers for blueberry cultivation research in the USA. Our blueberry specialist, Dr. Wei Yang, PhD. Is an expert in all aspects of blueberry culture and will personally supervise our initial shipments to India.

Washington State:

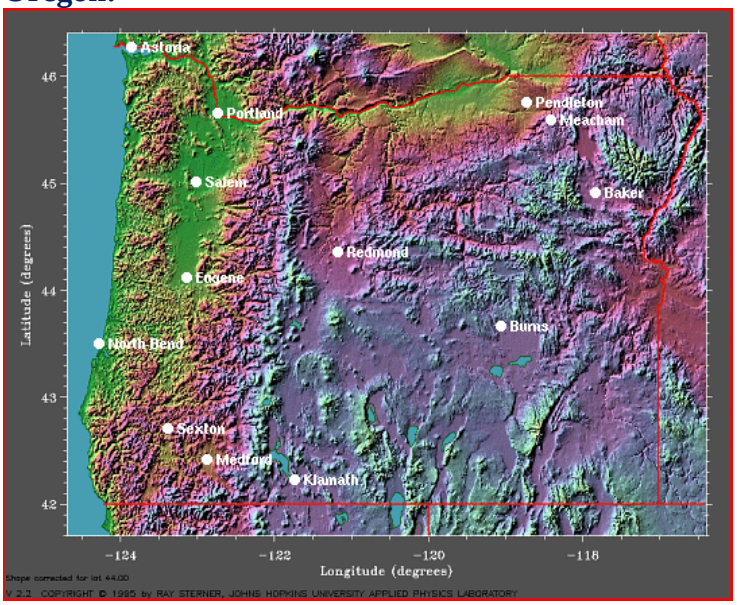
Washington state is a long time production region of blueberries and most production is concentrated in the northern part of the state in Skagit and Whatcom Counties near the border of British Columbia, Canada. Smaller amounts of blueberries are produced in the southern part of the state near Portland Oregon and new plantings are in the eastern part of the state. Production peaks in Washington in July and runs until the end of September. Fresh Washington blueberries have been successfully shipped to Japan and other Asian locations for the past decade without any pest or phytosanitary problems.

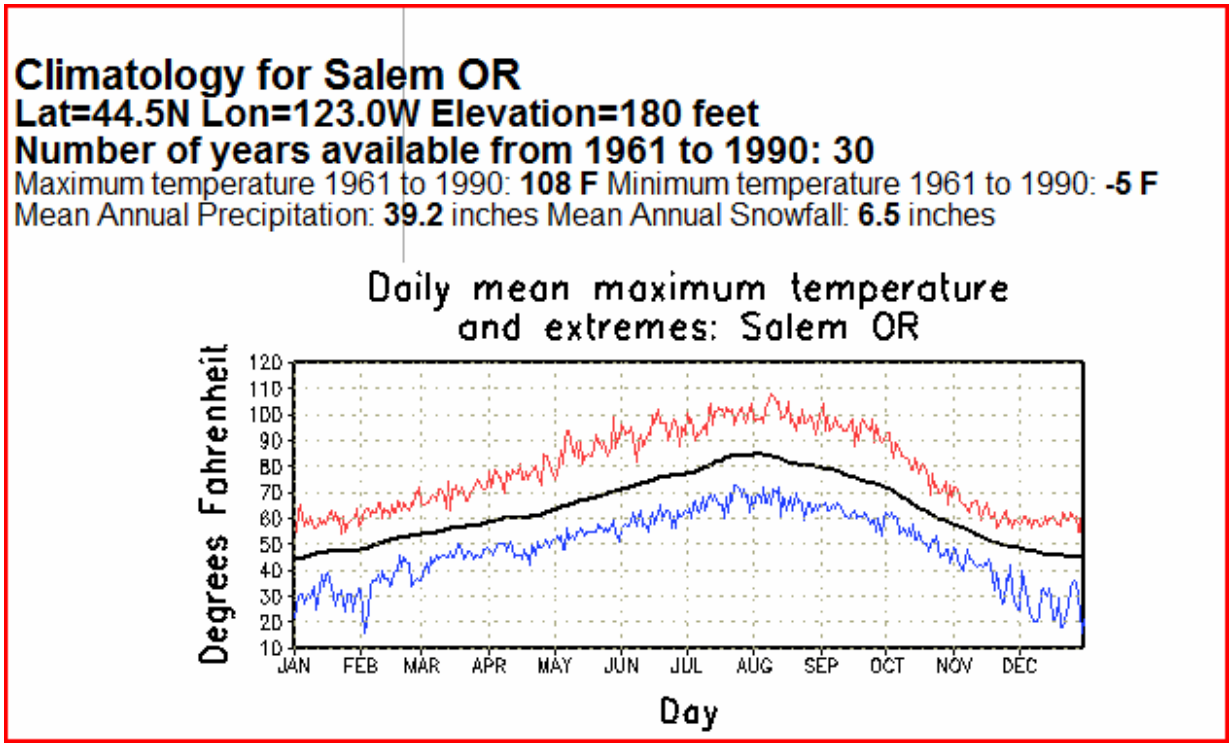
British Columbia, Canada.

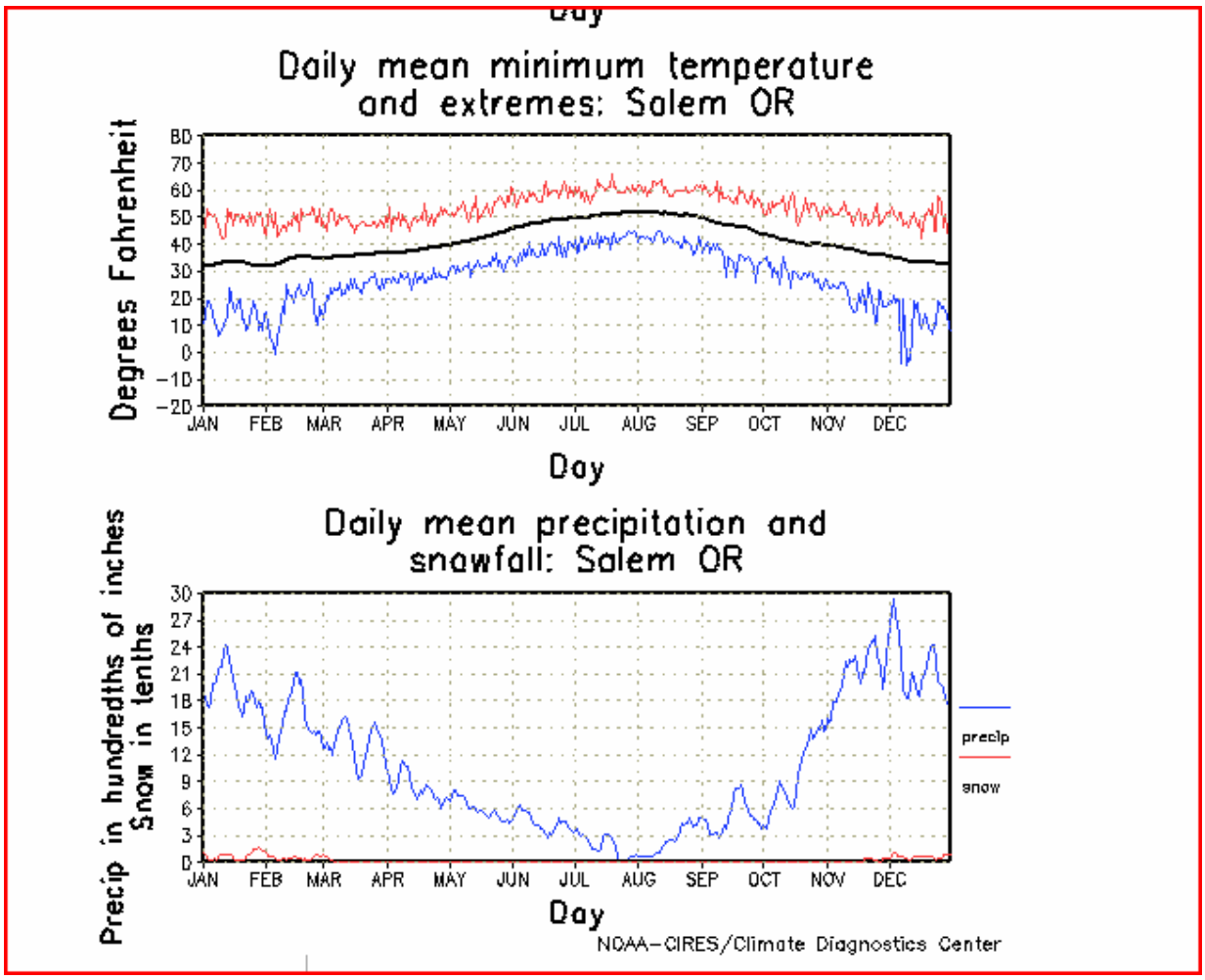
For all purposes, British Columbia, Canada is an important part of North American blueberry production and will supply fresh blueberries for our promotional activities in India. Production is concentrated in areas of the Frazier River Valley east of Vancouver BC and extend inland to the area of Abbotsford, which is the center for production. Note that more than 85 percent of all blueberries produced in BC are from farms owned by Indo-Canadians, who have a great deal of pride and enthusiasm in the prospect of shipping their product to their ancestral homeland. Like the rest of the west coast, BC growers are major shippers of fresh blueberries to Japan and the Far East. The region is isolated from the Midwest and East Coast of Canada and the USA and is considered one of the premiere blueberry growing regions of the world. BC has a later season than the rest of the continent, and we hope to bring fresh BC berries to India in the later part of the Season, September and October.

Agro-climatic zones (Maps)

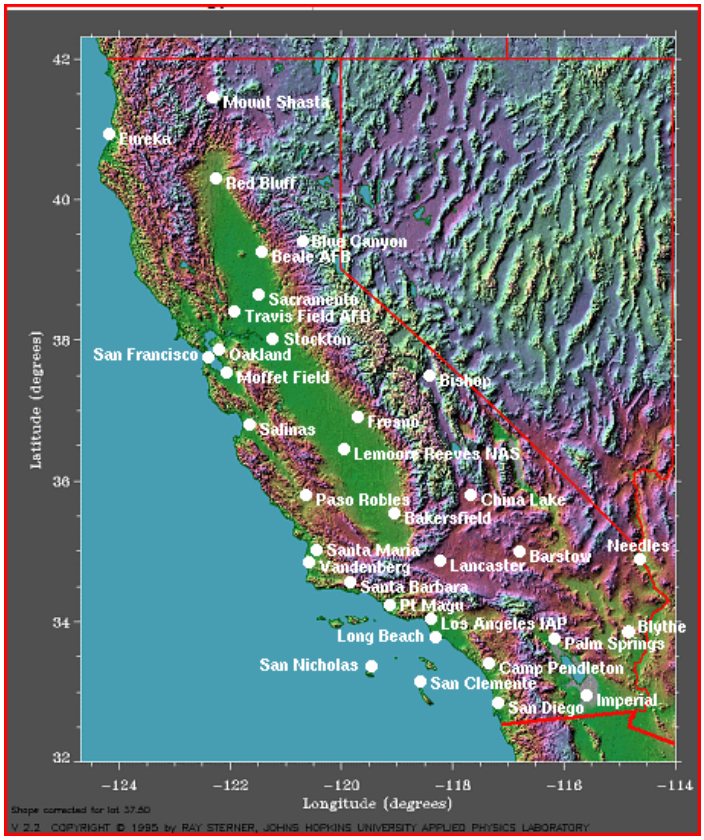
Oregon:





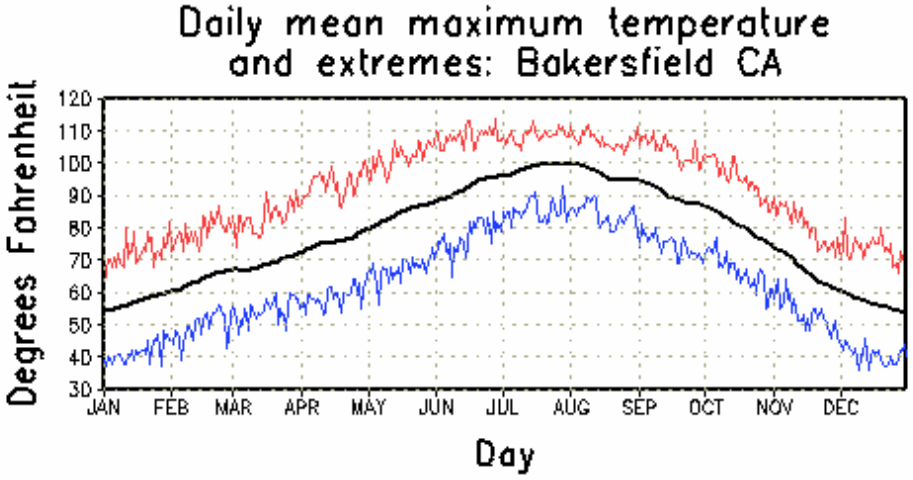

Daily mean minimum temperature
and extremes: Salem OR
Degrees Fahrenheit
80
70
60
50
40
30
20
10
0
-10
-20
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
Day
Daily mean precipitation and
snowfall: Salem OR
Precip in hundredths of inches
Snow in tenths
30
27
24
21
18
15
12
9
6
3
0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
Day
precip
snow
NOAA-CIRES/Climate Diagnostics Center

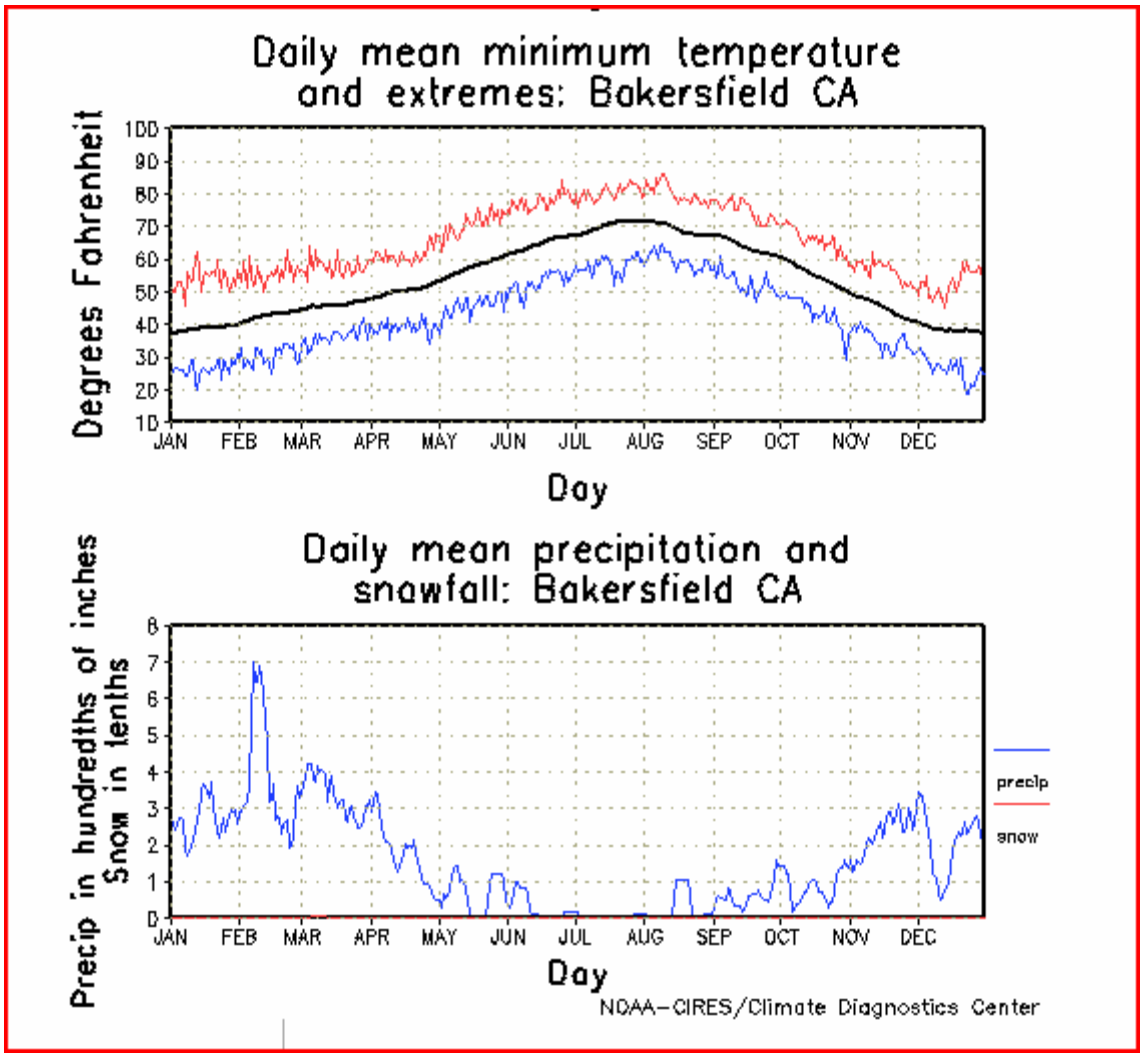
California:



South San Joaquin Valley Growing Region

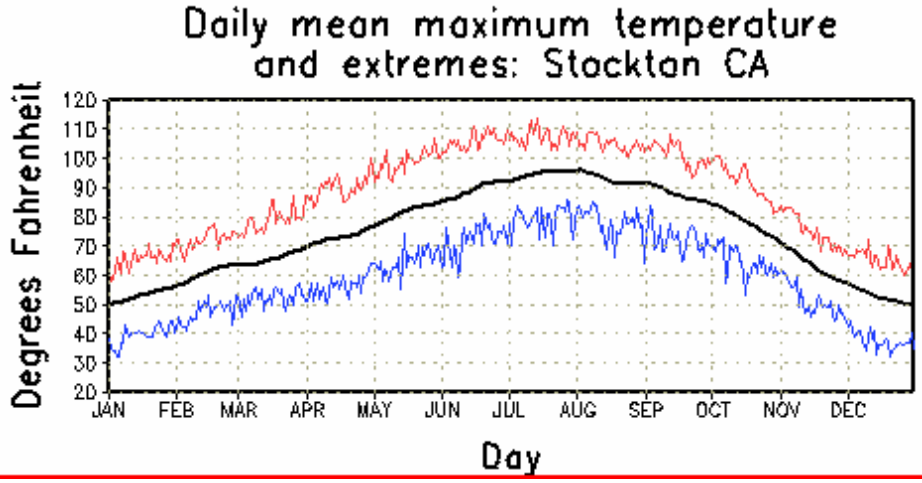
Climatology for Bakersfield CA
Lat=35.2N Lon=119.0W Elevation=492 feet
Number of years available from 1961 to 1990: 30
Maximum temperature 1961 to 1990: **114 F** Minimum temperature 1961 to 1990: **19 F**
Mean Annual Precipitation: **5.7** inches Mean Annual Snowfall: **0.1** inches

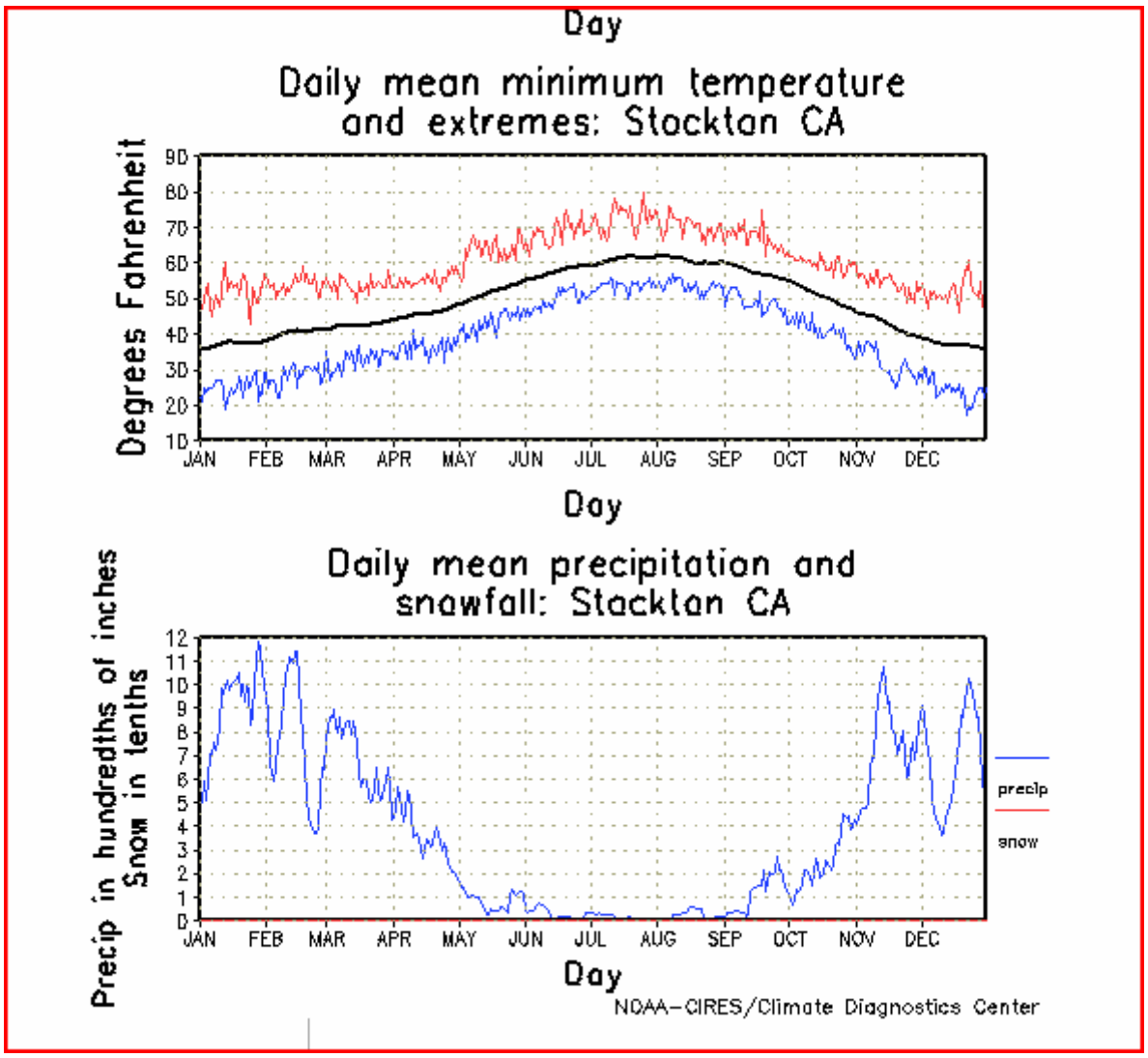



Daily mean minimum temperature and extremes: Bakersfield CA
Degrees Fahrenheit
100
90
80
70
60
50
40
30
20
10
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
Day
Daily mean precipitation and snowfall: Bakersfield CA
Precip in hundredths of inches
Snow in tenths
8
7
6
5
4
3
2
1
0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
Day
precip
snow
NOAA-CIRES/Climate Diagnostics Center

North San Joaquin Valley Growing Region

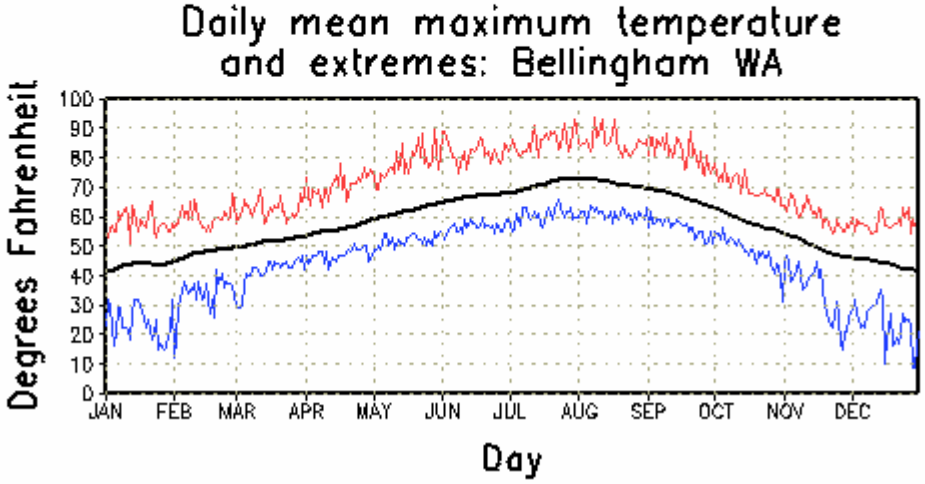
Climatology for Stockton CA
Lat=37.5N Lon=121.2W Elevation=23 feet
Number of years available from 1961 to 1990: 30
Maximum temperature 1961 to 1990: **114 F** Minimum temperature 1961 to 1990: **17 F**
Mean Annual Precipitation: **14.0** inches Mean Annual Snowfall: **0.0** inches

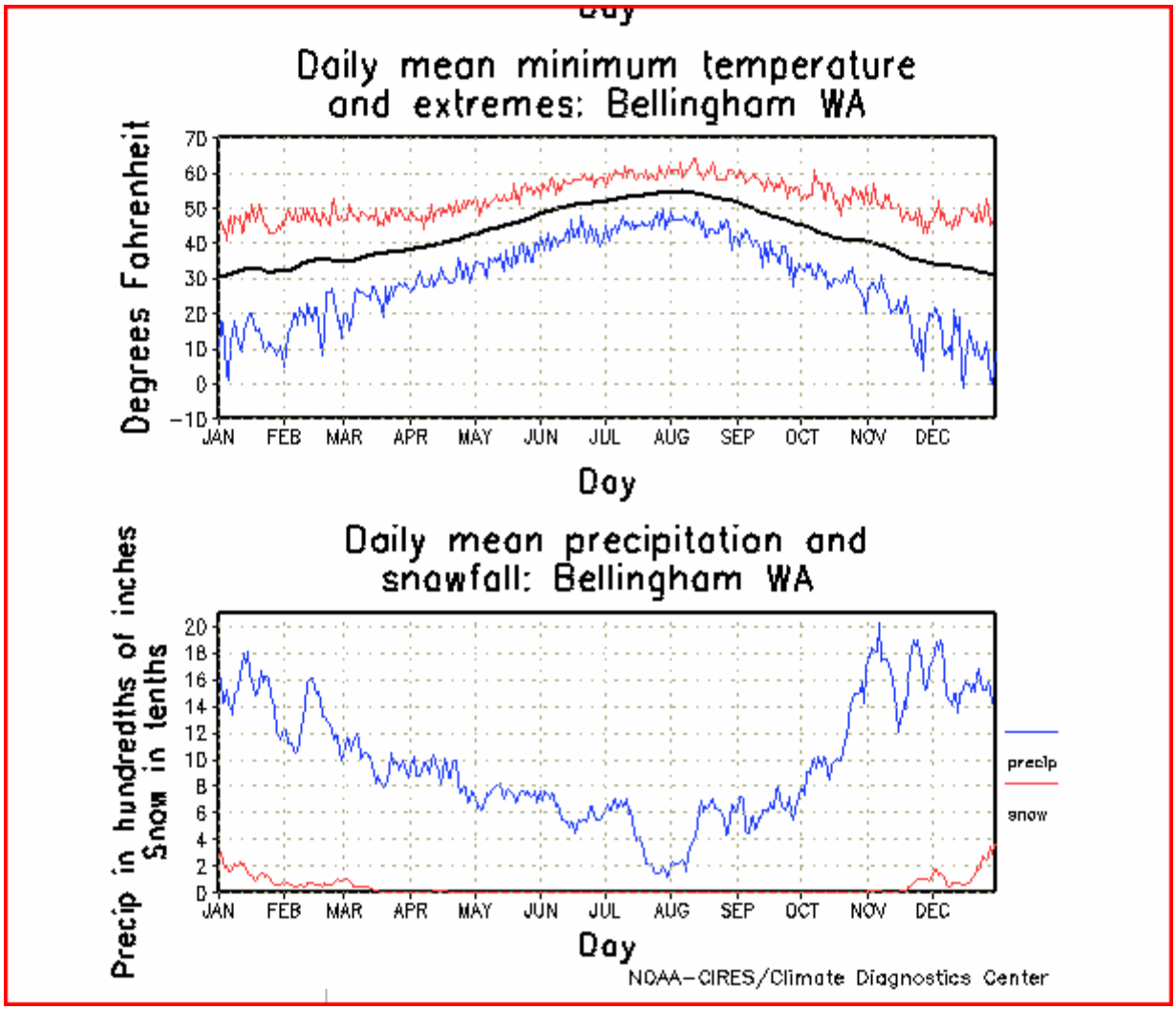



Day
Daily mean minimum temperature
and extremes: Stockton CA
Degrees Fahrenheit
90
80
70
60
50
40
30
20
10
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
Day
Daily mean precipitation and
snowfall: Stockton CA
Precip in hundredths of inches
Snow in tenths
12
11
10
9
8
7
6
5
4
3
2
1
0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
Day
precip
snow
NOAA-CIRES/Climate Diagnostics Center

Washington State/ North Lower Mainland of British Columbia Canada

Climatology for Bellingham WA
Lat=48.5N Lon=122.3W Elevation=59 feet
Number of years available from 1961 to 1990: 30
Maximum temperature 1961 to 1990: **94 F** Minimum temperature 1961 to 1990: **-1 F**
Mean Annual Precipitation: **36.1** inches Mean Annual Snowfall: **13.7** inches





Pest-free areas/production sites (established & maintained as per international standards)

Internal regulatory measures, restrictions (pest-free areas)
Contracted area/Quantity for export

3. Cultivation Methods

Agronomic practices: Blueberries are perennial crops grown in fertile agricultural land in the San Joaquin Valley of California, Willamette Valley of Oregon and Whatcom and Skagit Counties of Washington State and the Frazier River Valley of the Lower Mainland of British Columbia. It takes seven years for blueberry plant to reach its full production potential. The production method involved pruning, irrigation, fertilizer application, and disease and pest control. All cultural practices follow guidelines and recommendations from Oregon State University's commercial blueberry guide and other institutions such as the University of California Cooperative Extension Service, Washington State University Cooperative Extension

Service and Agricultural Canada. All agricultural pesticides used for production are approved and regulated by Environmental Protection Agency (EPA) of the United States. The blueberries for exportation will accompany a phyto-sanitary certificate issued by the Oregon State Department of Agriculture, California Department of Food and Agriculture, State of Washington Department of Food and Agriculture or the Provincial Government of British Columbia and AgCanada..

Blueberries are hand-picked in the early morning to avoid high temperatures and are directly placed in plastic boxes, which are protected from the sun, and can hold approximately four kilograms of fruit. From the field, boxes are taken to a packing facility where the high quality fruit is selected and packed in the shell packs (125-175 grams) in which they will be sold. Fruit is not washed or treated. Shell packs are placed in containers that hold 8 to 12 shell packs each. Within six hours after harvest, these containers are forced air-cooled at production sites to lower field temperatures down to 6-8°C, and then are stored in cooled chambers at 1°C, until export. From the production sites to the export points, fruit containers are loaded onto refrigerated trucks that maintain a storage temperature of 1°C. Prior to exportation, the fruit is inspected for a phytosanitary certificate. Fruit pallets are then hermetically sealed with a thermal blanket that maintains the temperature during transport (Gel packs are also kept on the pallets to help keep the commodity cool.

Pest management practices (chemical/bio-control agents/others)

Although nearly 200 diseases and more than 300 insect species have been reported on blueberries, only 20 to 25 ever become abundant enough to cause economic losses, and only 5 or 6 of these are chronic problems that require control every year. As a rule, the most damaging pests are those which attack the buds, destroy the fruit, or threaten survival of the plant.

Maintaining a clean, healthy stand of blueberry bushes is one of the most effective ways to insure good control of diseases and arthropod pests. Weedy fields and field margins provide shelter and overwintering sites for some pests, and dead canes or dying bushes can serve as breeding grounds or sources of inoculum for others. Regular cultivation of the soil kills insects that pupate under dead leaves or near the soil surface, and a good program of fertilization and water management keeps plants vigorous and better able to tolerate small amounts of injury.

In addition to clean cultural practices, a successful blueberry grower also needs a carefully planned strategy for applying pesticides. The effectiveness of control operations is influenced not only by the types of chemicals used, but also by the method and timing of their application.

In general, there are eight time periods throughout the year when it may be appropriate to use pesticides to suppress diseases or arthropods on blueberries. The following synopsis describes which pests can be controlled during each period, how to estimate optimal timing for treatments, and what other management options should be considered. Although a different spectrum of pests can be controlled during each interval, growers do have a little flexibility in the management of some minor pests (such as scales). A few pests may require multiple applications, but individual fields should rarely need treatment during more then three or four

time periods during the year. This summary is no substitute for experience and careful observation. However, it does outline some of the important considerations that should go into making sound pest management decisions.

DORMANT SEASON - Selective pruning of old and diseased wood can suppress populations of blueberry bud mites and reduce inoculum for twig blight, stem blight, and canker. Clean cultivation inhibits the spread of mummy berry, and clearing the ground cover in surrounding woods and field margins destroys overwintering plum curculio and the eggs of sharpnosed leafhoppers.

- The fall or winter (after leaves have fallen) is the best time to look for STEM CANKER lesions. This disease begins early in the spring when spores penetrate open stomata and produce red lesions on young, actively growing shoots. These lesions enlarge gradually over several years until the stem becomes girdled and dies. At least eight races of stem canker are present in the eastern United States. No remedial or preventive treatments are effective against this fungus, but the disease has been successfully managed in North Carolina by planting cultivars that are resistant to the dominant biotype (race 4).
- Dormant oil can be applied to blueberry bushes on warm days (>50°F) in late winter before flower buds begin to open. The oil is an effective way to kill overwintering populations of TERRAPIN SCALE, wax scales, or other scale insects that infest blueberry plants. Use only a high grade petroleum oil (70-second superior type) labelled and sold specifically as an insecticide. Mix 2-3 gallons of oil in 100 gallons of water and apply 50 to 100 gallons of water per acre (depending on bush size). Thorough spray coverage is essential for good scale control.

PRE-BLOOM

- The first few weeks following bud break are critical in the infection cycles of **mummy berry** and **twig blight**, two of the most serious blueberry diseases.

- TWIG BLIGHT is a fungal disease that spreads in early spring by spores released from dead twigs (infected the previous season). Infected terminals quickly die back 2 to 6 inches and destroy fruiting potential for an average of 6 buds per twig. Twig blight can be controlled with two or three applications of Benlate. Sprays should be applied at 7-10 day intervals from bud swell through full bloom.
- MUMMY BERRY is a fungus disease that overwinters in the soil where infected, mummified fruit have fallen the previous year. Spores infect new leaves just as they begin to unroll from the bud. Mummy berry inoculum can be reduced by collecting and destroying infested fruit, or by discing the soil to bury mummies from the previous season (those covered by more than two inches of soil seldom germinate). The disease can be suppressed chemically by using Funginex (triforine) every 7-10 days between bud break and full bloom. Benlate will control secondary (fruit) infections, but it is ineffective against primary (leaf) infections.
- Insect control is rarely needed before petal-fall, but occasionally fruit buds must be protected from outbreaks of CUTWORMS, SPANWORMS or CRANBERRY

WEEVILS. These insects can usually be controlled with a single pre-bloom spray applied just as fruit buds begin to swell. Use an insecticide (such as Guthion) that is effective at low temperatures and avoid micro-encapsulated formulations that bees might mistake for pollen grains.

BLOOM

- Beginning around full bloom, blueberry plants become susceptible to RIPE ROT (Anthracnose fruit rot) and other FRUIT ROT diseases. Chemical control of fruit rot is best achieved with two or three applications of Captan at 10-14 day intervals beginning at full bloom. Benlate and Funginex are not very effective against these diseases.
- Because of the importance of honey bees and bumble bees in the POLLINATION of blueberries, no insect control activities are advisable during bloom.

PETAL-FALL

Although fungicide applications may continue well past bloom, insect control is the primary consideration in the weeks immediately following petal fall. Of all insect pests, those active just after bloom represent the greatest potential injury to a blueberry crop because they damage the fruit or transmit disease. Contact insecticides, applied as cover sprays, should give adequate control of PLUM CURCULIO, CRANBERRY FRUITWORM, CHERRY FRUITWORM, and the first generation of SHARPNOSED LEAFHOPPERS. Ideally, the first spray should be applied after bees finish working the plants **AND** mean daily temperatures reach 70°F. Applications made too early in the season are wasteful of time and materials because the pests are not yet active in the fields. Usually two cover sprays are needed after petal-fall to obtain satisfactory control of fruitworms. However, when **plum curculio** are present, these sprays should be continued weekly until daytime temperatures reach 90°F.

Effective management of BLUEBERRY STUNT DISEASE requires season-long leafhopper control combined with prompt removal of infected plants. In the North, one spring application of insecticide has given satisfactory leafhopper control, but in the South additional sprays are needed later in the season to prevent spread of the disease by migrants of the second and third generations. Yellow sticky traps placed on low vegetation in the woods are a good way to monitor leafhopper populations. Record trap catch weekly and apply a cover spray to fields and field margins when the trap catch of adults begins to increase for each generation.

PRE-HARVEST

In mid summer, around the time of harvest, blueberry plants may begin to show symptoms of STEM BLIGHT. This fungus disease causes sudden die-back of one or more branches. Leaves turn red, yellow, and brown as they dry, but remain firmly attached to the stem. When affected branches are cut lengthwise, they show a brown discoloration of the woody tissues. Stem blight

cannot be controlled with fungicides, but pruning out the dying stems soon after they show signs of the disease may help reduce inoculum and keep the fungus from spreading through the crown to other parts of the same plant.

BLUEBERRY MAGGOT is the most important insect pest to look for just before harvest. Adult flies can be detected before they reach damaging levels by trapping them on yellow sticky boards (2-4 traps per acre) baited with ammonium acetate or protein hydrolysates. A treatment threshold of three adults per trap per week (or five adults per field per week) gives adequate lead time for chemical control if the traps are in place before the first flies emerge.

When control is necessary, a short-residual pesticide (e.g. Malathion) should be used. Apply this spray from the ground whenever possible to get maximum coverage on the lower half of the bushes. If ripe berries are already present, the available crop should be harvested just before the field is treated. If weather or labor conditions prevent harvest and ground application within five days, affected fields should be sprayed by air immediately. Insecticide applications should be repeated every 7-10 days until all unharvested fruit has dropped. If possible, use a picking machine to strip remaining fruit; this eliminates possible oviposition sites and should reduce future populations. Following this strategy for several years should allow growers to gradually eradicate spot infestations of the blueberry maggot.

FIRE ANTS can be both a nuisance and a health hazard to people who work in blueberry fields. Nest sites (mounds) can be treated by drenching them with a dilute solution of diazinon. Dissolve one pound of the 50 WP formulation **or** dilute one pint of the AG500 formulation in 100 gallons of water and slowly pour one to two gallons of this mixture onto each mound (use about 1 gallon per 6 inches of mound diameter). The insecticide works on contact to kill the worker ants, larvae, and (hopefully) the queen as well. If all the ants are not killed, survivors may construct small satellite nests nearby. A follow-up treatment may be needed a few days later to kill these mounds. All drench treatments must be completed at least 18 days before harvest.

Several species of fungi cause LEAF SPOTS that develop in mid-summer. Light infestations are generally inconsequential, but severe ones can cause premature defoliation, weaken the plant, and reduce fruiting potential for the following year.

Fungicidal control of leaf diseases is best accomplished early in the season by spraying susceptible cultivars **BEFORE** large numbers of leaf spots appear. A pre-harvest combination spray of Captan+Benlate applied in early May will significantly reduce the amount of leaf disease that appears after harvest. Care must be taken not to apply Benlate within 21 days of harvest.

HARVEST

- A foliar application of Sevin during harvest will give temporary relief from FIRE ANTS that were not killed by mound drenches earlier in the season. One treatment (0.5 lb. a.i. per acre) on the day before picking should suppress foraging workers for several days, but it will not kill the queen or larvae inside the nest.

- FRUIT ROT FUNGI can cause severe losses during and after harvest if berries are not handled and stored properly. Timely harvesting, sanitation, and post-harvest cooling are essential for maintaining fruit quality because fungicides applied at harvest (or in post-harvest storage) are NOT effective.

POST-HARVEST

- BLUEBERRY BUD MITES, YELLOWNECKED CATERPILLARS many other foliage or stem feeders, and the second generation of SHARPNOSED LEAFHOPPERS can be treated with pesticide applications in July. Monitor the **sharpnosed leafhoppers** with yellow sticky traps (as described previously) and apply a cover spray of Malathion near the peak of adult flight activity. If **bud mites** are also a problem, use a tank mix of Thiodan and 70-second superior oil; repeat this application two weeks later. Since mites are well-protected under bud scales, adequate spray material must be applied at high pressure to cover and penetrate the buds. Good coverage may require 200 to 400 gallons of spray per acre (depending on plant size) applied with approximately 200 p.s.i. of nozzle pressure.
- A small mound of yellow sawdust (frass) on the ground near the base of a blueberry plant is good evidence of infestation by a STEM BORER. The larva of this beetle tunnels inside the cane and pushes its sawdust-like excrement out through a small hole. Infested canes are easy to spot by looking for mounds of frass. This pest is seldom very abundant and it can be controlled simply by pruning out affected canes.
- Post-harvest disease management involves continuation of biweekly leafspot sprays and scouting for problem areas. Two types of disease generally cause premature defoliation: **leaf spots** and **root rots**.
- Defoliation of a bush by LEAF SPOT DISEASES occurs from the bottom up, with the oldest leaves falling off first. Once a bush is severely defoliated, fungicidal sprays are not effective. However, growers should record problem areas and be ready to apply pre-harvest and early summer leaf spot sprays the following season.
- Leaf drop caused by root diseases, primarily PHYTOPHTHORA ROOT ROT, can be distinguished from defoliation caused by leaf spot fungi because root rot problems usually occur in discrete areas where drainage problems exist. Look for defoliated bushes associated with areas of excessively wet soil. Bushes suffering from root rot usually have smaller leaves that begin turning red or yellow in mid to late summer. Improved drainage is the only long-term solution for root rot problems.

Pest surveillance programmes (Documented information/reports as per international standards) Blueberry farmers live in close proximity to fields and regularly walk fields, checking for pests. Each state employs the services of Cooperative Extension (County Agents) who assist growers with spotting and addressing any pest difficulties. County Agents are well advised on new procedures and practices for pest eradication and prevention and share this information with growers.

Cropping seasons: Blueberries are produced on the West Coast of the USA from May until October. Typically production starts in Southern California in April and ends in British Columbia in October.

Region	May	Jun	July	Aug	Sept	Oct	Nov	Dec	
CA									
OR									
WA									
BC									

Harvesting/Storage methods

4. Host-pest lists (insects/mites/nematodes/fungi/bacteria/viruses etc)

Scientific Name of Pest & Author
Common Name
Taxonomy (Class/Order)
Synonyms
Pest Distribution
Host species/varieties
Plant parts affected
Stage of crop affected
Economic significance
Symptoms/Biology
Control Measures adopted
References

Table 4. Pests associated with commodity (in any country)					
Pest	**Geographic Distribution[1]**	**Plant Part Association [2]**	**Quaran-tine Pest[3]**	**Follows Pathway**	**Host association**
ARTHROPODS					
ACARINA					
Tarsonemus sp. Acarina / Tarsonemidae	US (CPC, 2004; Bentancourt and Scatoni, 1999)	L, S, Fl, F (CPC, 2004; PIN309, 2005)	No[4]	Yes	PIN309, 2005.

[1] Geographic Distribution: US (United States)
[2] Abbreviations to indicate plant parts: R (Roots), L (Leaves), B (Branches), S (Stem), Fl (Flowers), F (Fruit), C (Cotyledons), Sl (Seedlings), Sd (Seed)
[3] For organisms identified only to the genus level: PPQ considers these organisms as potentially quarantine species if there are species in the genus that are quarantine pests with respect to the United States, even if the genus in question occurs in the United States.

Table 4. Pests associated with commodity (in any country)					
Pest	**Geographic Distribution[1]**	**Plant Part Association [2]**	**Quarantine Pest[3]**	**Follows Pathway**	**Host association**
Bryobia praetiosa Koch Acarina / Tetranychidae	US (Jeppson et al., 1975; Bentancourt and Scatoni, 1999); Bolland et al., 1998	L, Fl (Jeppson et al., 1975)	No	No	USDA-APHIS-PPQ, 2004; Bolland et al., 1998[5]
Tetranychus urticae (Koch) Acarina / Tetranychidae	US (CPC, 2004; Bentancourt and Scatoni, 1999); Bolland et al., 1998	L (CPC, 2004)	No	No	Casals, 2004; Koch et al., 2000, SAG, 2005; USDA-APHIS-PPQ, 2004
DIPTERA					
Anastrepha fraterculus (Wiedemann) Diptera / Tephritidae	UY, US (TX) (CPC, 2005)	F (CPC, 2005)	[Yes]	Yes	(Vaccaro and Bouvet, 2006)
COLEOPTERA					
Apion sp. Coleoptera / Curculionidae	US (CPC, 2004; Bentancourt and Scatoni, 1999, Ross, 1997)	L, Fl, F (Bentancourt and Scatoni, 1999; PIN309, 2005)	Yes	Yes[6]	USDA-APHIS-PPQ, 2004; PIN309, 2005
Conotrachelus sp. Coleoptera / Curculionidae	US[7] (CPC, 2004; Bentancourt and Scatoni, 1999, Ross, 1997)	L, F (CPC, 2004; PIN309, 2005)	Yes	Yes[8]	PIN309, 2005
Listroderes sp. Coleoptera / Curculionidae	US (CPC, 2004; Bentancourt and Scatoni, 1999, Ross, 1997)	R, L, S, F (CPC, 2004; PIN309, 2005)	Yes	Yes[9]	PIN309, 2005

[5] Bolland *et al*. (1998) cited this pest on *V. myrtillus* (Bentancourt and Scatoni, 1999). Not analyzed further, see text in Section 2.5, which follows this table.
[7] Species present in Uruguay: *Conotrachelus cristatus*, attacking celery (Bentancourt and Scatoni, 1999).
[8] Not analyzed further, see text in Section 2.5, which follows this table.
[9] Not analyzed further, see text in Section 2.5, which follows this table.

Table 4. Pests associated with commodity (in any country)					
Pest	**Geographic Distribution[1]**	**Plant Part Association [2]**	**Quaran-tine Pest[3]**	**Follows Pathway**	**Host association**
Naupactus leucoloma Boheman Coleoptera / Curculionidae	US (CPC, 2004; Bentancourt and Scatoni, 1999)	R, L (CPC, 2004)	No	No	Casals, 2004, Devotto et al., 2005; Hepp, 2005; INIA, Instituto de Investigaciones Agropecuarias (INIA), 2003; Koch et al., 2000; SAG, 2005.
Blapstinus punctulatus Solier Coleoptera / Tenebrionidae	US (FL, TX) (www.coleoptera.org; Bentancourt and Scatoni, 1999)	S, L, F, C, Sl (PIN309, 2005; AgroImpulso 2000; Bentancourt and Scatoni, 1999)	[Yes]	No[10]	PIN309, 2005
HEMIPTERA					
Dialeurodes citri (Ashmead) Hemiptera / Aleyrodidae	US (CPC, 2004; Miller et al., 2000; Bentancourt and Scatoni, 1999)	L (CPC, 2005)	No	No	CPC, 2003: CPC, 2004; USDA-APHIS-PPQ, 2004
Trialeurodes vaporariorum (Westwood) Hemiptera / Aleyrodidae	US (CPC, 2004; Miller et al., 2000; Bentancourt and Scatoni, 1999)	L (CPC, 2004)	No	No	Casals, 2004; Gonzalez et al., 2005; MGAP, 2005a
Aphis gossypii Glover Hemiptera / Aphididae	US (CPC, 2004; Bentancourt and Scatoni, 1999)	S, L, Fl (CPC, 2004)	No	No	Gonzalez et al., 2005, Koch et al., 2000, MGAP, 2005a, SAG, 2005

[10] *Blapstinus punctulatus* has only been intercepted a single time on blueberry shipments at U.S. ports-of-entry (PIN309, 2005); this is insufficient evidence that it will follow the pathway on fresh blueberry fruit on a regular basis .

Table 4. Pests associated with commodity (in any country)					
Pest	**Geographic Distribution[1]**	**Plant Part Association [2]**	**Quaran-tine Pest[3]**	**Follows Pathwa y**	**Host association**
Myzus persicae (Sulzer) Hemiptera / Aphididae	US (CPC, 2004; Bentancourt and Scatoni, 1999)	L, S (CPC, 2004)	No	No	Buzeta, 1997; Casals, 2004; USDA-APHIS-PPQ, 2004
Ceroplastes sinensis (Linneo) Hemiptera/ Coccidae	US (Bentancourt and Scatoni, 1999; Polavarapu et al., 2000; Stimmel, J. F., 1998)	L, S, F (Stimmel, J., 1998; PIN309, 2005)	No	Yes	Polavarapu et al., 2000
Coccus hesperidum Linneo Hemiptera/Coccidae	US (CPC, 2004; Polavarapu et al., 2000; Bentancourt and Scatoni, 1999)	L, S (CPC, 2004)	No	No	CPC, 2003; CPC, 2004; Koch et al., 2000; Polavarapu et al., 2000; USDA-APHIS-PPQ, 2004
Saissetia oleae (Olivier) Hemiptera / Coccidae	US (CPC, 2004; Polavarapu et al., 2000; Bentancourt and Scatoni, 1999)	L, S (CPC, 2004)	No	No	Polavarapu et al., 2000, USDA-APHIS-PPQ, 2004
Aspidiotus nerii Bouché Hemiptera / Diaspididae	US (CPC, 2004; Polavarapu et al., 2000; Bentancourt and Scatoni, 1999)	L, B, F (CPC, 2004)	No	Yes	Polavarapu et al., 2000; SAG, 2005; USDA-APHIS-PPQ, 2004
Diaspidiotus perniciosus (Comstock) *Cockerell*, Hemiptera / Diaspididae	US (CPC, 2005; Polavarapu et al., 2000; Bentancourt and Scatoni, 1999)	L, S, F (CPC, 2004)	No	Yes	CPC, 2003; CPC, 2004; CPC, 2005 Polavarapu et al., 2000
Hemiberlesia rapax (Comstock) Hemiptera / Diaspididae	US (CPC, 2004; Bentancourt and Scatoni, 1999)	L, S, F (CPC, 2004)	No	Yes	CPC, 2003; Koch et al., 2000; SAG, 2005; USDA-APHIS-PPQ, 2004

Table 4. Pests associated with commodity (in any country)					
Pest	**Geographic Distribution[1]**	**Plant Part Association [2]**	**Quarantine Pest[3]**	**Follows Pathway**	**Host association**
Lepidosaphes ulmi (Linneo) Hemiptera / Diaspididae	US (CPC, 2004; Polavarapu et al., 2000; Bentancourt and Scatoni, 1999)	L, S (CPC, 2004 USDA-APHIS-PPQ, 2004)	No	No	CPC, 2003; CPC, 2004; Polavarapu et al., 2000; USDA-APHIS-PPQ, 2004
Pseudaulacaspis pentagona (Targioni-Tozzetti) Hemiptera / Diaspididae	US (Polavarapu et al., 2000; Bentancourt and Scatoni, 1999)	R, L, S	No	No	Polavarapu et al., 2000; USDA-APHIS-PPQ, 2004
Nysius sp. Hemiptera / Lygaeidae	US[11] (CPC, 2004; Jubb et al., 1979; Bentancourt and Scatoni, 1999)	L, F (PIN309, 2005)	Yes	Yes[12]	PIN309, 2005
Icerya purchasi Maskell Hemiptera / Margarodidae	US (CPC, 2004; Bentancourt and Scatoni, 1999)	L, S (CPC, 2004)	No	No	Casals, 2004; Silva et al., 2005
Pseudococcus calceolariae Hemiptera / Pseudococcidae	US (CPC, 2004; Bentancourt and Scatoni, 1999)	R, S, L, B, F (CPC, 2004; SAG, 2005)	No	Yes[13]	Koch et al., 2000; SAG, 2005
Pseudococcus viburni (Signoret) Hemiptera / Pseudococcidae	US (CPC, 2004; Laflin et al., 2004 Bentancourt and Scatoni, 1999)	R, S, B (SAG, 2005)	No	No	SAG, 2005
LEPIDOPTERA					
Anacampsis sp. Lepidoptera / Gelechiidae	US[14] (CPC, 2004; Bentancourt and Scatoni, 1999)	L, F (Bentancourt and Scatoni, 1999; PIN309, 2005)	Yes	Yes	PIN309, 2005

[12] Not analyzed further, see text in Section 2.5, which follows this table.

Table 4. Pests associated with commodity (in any country)					
Pest	**Geographic Distribution[1]**	**Plant Part Association [2]**	**Quaran-tine Pest[3]**	**Follows Pathway**	**Host association**
Agrotis ipsilon (Hufnagel) Lepidoptera / Noctuidae	US (CPC, 2004; Bentancourt and Scatoni, 1999)	L, S (CPC 2004)	No	No	Buzeta, 1997; Casals, 2004; Gonzalez et al., 2005; Hepp, 2005; Koch et al., 2000; MGAP, 2005a; SAG, 2005.
Agrotis sp. Lepidoptera/Noctuidae	US (CPC, 2004; Bentancourt and Scatoni, 1999)	L, S (CPC, 2004)	Yes	No	PIN309, 2005; USDA-APHIS-PPQ, 2004
Helicoverpa zea (Boddie) Lepidoptera / Noctuidae	US (CPC, 2004; Bentancourt and Scatoni, 1999)	L, Fl, F (CPC, 2004)	No	Yes	Casals, 2004; Koch et al., 2000; USDA-APHIS-PPQ, 2004
Peridroma saucia (Hubner) Lepidoptera / Noctuidae	US (CPC, 2004; Bentancourt and Scatoni, 1999)	L, S, Fl (CPC, 2004)	No	No	CPC, 2003; USDA-APHIS-PPQ, 2004
Spodoptera eridania (Cramer) Lepidoptera / Noctuidae	US (CPC, 2004; Bentancourt and Scatoni, 1999)	L, F (CPC, 2004)	No	No[15]	CPC, 2003; USDA-APHIS-PPQ, 2004
Spodoptera frugiperda (J. E. Smith) Lepidoptera / Noctuidae	US (CPC, 2004; Bentancourt and Scatoni, 1999)	L, F (CPC, 2004)	No	No[16]	CPC, 2003; USDA-APHIS-PPQ, 2004
ORTHOPTERA					

[15] *Spodoptera eridania* is mainly a defoliating insect. Leaf-eating and skeletonization is the main damage caused to the host plant by *Spodoptera eridania*, and in extreme cases complete defoliation may occur. Larvae are not normally observed because they are nocturnal feeders, but the first two instars are gregarious and can be seen in clusters on the foliage. Based on this evidence, we concluded it is unlikely that this pest will follow the pathway.

[16] This pest is a large external feeder that mostly feeds on leaves, but does attack the fruit of corn (Capinera, 2005); thus, it is unlikely to follow the pathway.

Table 4. Pests associated with commodity (in any country)					
Pest	**Geographic Distribution[1]**	**Plant Part Association [2]**	**Quaran-tine Pest[3]**	**Follows Pathway**	**Host association**
Gryllus sp. Orthoptera / Gryllidae	US[17] (CPC, 2004; Walker, 1999; Bentancourt and Scatoni, 1999)	L, F (PIN309, 2005)	Yes	No[18]	USDA, 2004; PIN309, 2005
THYSANOPTERA					
Frankliniella occidentalis (Pergande) Thysanoptera / Thripidae	US (CPC, 2004; Bentancourt and Scatoni, 1999)	L, Fl (CPC, 2004; Scherm et. al, 1999)	No	No	Scherm et al., 1999, USDA-APHIS-PPQ, 2004
Frankliniella sp. Thysanoptera / Thripidae	US (CPC, 2005)	L, Fl, F (CPC, 2005)	Yes	Yes[19]	PIN309, 2005
Thrips sp. Thysanoptera / Thripidae	US (CPC, 2004; Bentancourt and Scatoni, 1999)	L, F (PIN309, 2005)	Yes	Yes[20]	PIN309, 2005
BACTERIA[21]					
Burkholderia andropogonis (Smith) *Gillis* Burkholderiales / Burkholderiaceae	US (CPC, 2005)	S, L, Fl, Sl	No	No	CPC, 2005
Pseudomonas syringae pv. *syringae* van Hall 1902	US (Caruso et al., 1995; CPC, 2004)	L, S, Fl, F (CPC, 2004)	No	Yes	Bradbury, 1986; Caruso et al., 1995; CPC, 2003; CPC, 2004; Guerrero, 2000; Hepp, 2005; SAG, 2005; Strik, 2005

[17] Species present in Uruguay is *Gryllus assimilis*

[18] *Gryllus* species are large, mobile species that readily jump when disturbed, and therefore would be unlikely to remain with the fruit through standard harvest and postharvest handling.

[19] Not analyzed further, see text in Section 2.5, which follows this table.

[20] Not analyzed further, see text in Section 2.5, which follows this table.

[21] Bacterial Taxonomic Classification (CPC, 2003).

Table 4. Pests associated with commodity (in any country)					
Pest	**Geographic Distribution[1]**	**Plant Part Association [2]**	**Quaran-tine Pest[3]**	**Follows Pathway**	**Host association**
Rhizobium radiobacter (Beijerinck & van Delden) Young et al. (Syn: *Agrobacterium tumefaciens* (E. F. Smith & Towsend) Conn)	US (CPC, 2004; Caruso et. al, 1995; Farr et al., 2005)	R (CPC, 2004; Gonzalez et al., 2005; SAG, 2005)	No	No	Bradbury, 1986; Buzeta, 1997; Caruso et al., 1995; CPC, 2004; Farr et al., 2005; Gonzalez et al., 2005; MGAP, 2005a
FUNGI[22]					
Alternaria alternata (Fr.) Keissl Ascomycetes: Pleosporales	US (Betucci, L. et al., 2004; CPC, 2004; Farr et al., 2005; Gonzalez et al., 2005)	L, FL, F (CPC, 2004)	No	Yes	CPC, 2004; Farr et al, 1989; Farr et al., 2005; Guerrero et al., 1993, Guerrero, 2000; Gonzalez et al, 2005; MGAP, 2005a.
Alternaria tenuissima (Kunze) Wiltshire Ascomycetes: Pleosporales	US (CPC, 2004; Farr et al. 2005; Gonzalez et al., 2005; MGAP, 2005a)	L, F (Caruso et al., 1995; Milholland et al., 1984)	No	Yes	Caruso et al., 1995; Cline et al., 2005; CPC, 2004; Farr et al., 2005; Fernandez et al., 2005a; Fernández et al., 2005b; Garcia Salazar, 2002; Gonzalez et al., 2005; MGAP, 2005a; Strik, 2005.

[22] Fungal Taxonomic Classification (9th Edition of the Dictionary of Fungi, www.indexfungorum.org/Names/Names.asp).

Table 4. Pests associated with commodity (in any country)					
Pest	**Geographic Distribution[1]**	**Plant Part Association [2]**	**Quaran-tine Pest[3]**	**Follows Pathway**	**Host association**
Botryosphaeria dothidea (Moug.) Ces. & de Not. (anamorph *Fusicoccum aesculi* Corda) Ascomycetes/ Dothideales	US (Betucci L. et al., 2004; CPC, 2004; Farr et al., 2005; Monteiro, 2005)	L, S, B (Caruso et al., 1995; Milholland et al., 1984)	No	No	Caruso et al., 1995; Cline, 1997; Cline et al., 2005; Cuevas et al., 2003; CPC, 2004; Farr et al. 2005; Johnson et al., 2003; SAG, 2004; SAG, 2005; Strik, 2005
Botryosphaeria sp. Ascomycetes/ Dothideales	US (Farr et al., 2005; Gonzalez et al., 2005; MGAP, 2005a)	L, S, B, F (Caruso et al., 1995; Milholland et al., 1984, PIN309, 2005)	Yes	Yes[23]	Farr et al., 1989; Farr et al., 2005, Gonzalez et al., 2005; MGAP, 2005a; USDA-APHIS-PPQ, 2004; PIN309, 2005

[23] Not analyzed further, see text in Section 2.5, which follows this table.

Table 4. Pests associated with commodity (in any country)					
Pest	**Geographic Distribution[1]**	**Plant Part Association [2]**	**Quaran-tine Pest[3]**	**Follows Pathway**	**Host association**
Botrytis cinerea Pers.: Fr [anamorph] Ascomycetes: Helotiales *Botryotinia fuckeliana* (de Bary) Whetzel [telomorph]	US (CPC, 2004; Caruso et al., 2005; Farr et al., 2005, Gonzalez et al., 2005; MGAP, 2005a; Weingartner and Klos, 1974)	L, S, B, Fl, F (CPC, 2004; Weingartner and Klos, 1974)	No	Yes	Andrade et al., 1993; Bell et al., 1999; Buzeta, 1997; Caruso et al., 1995; Cline et al., 2005, CPC, 2004; Farr et al., 2005; Gonzalez et al., 2005;; MGAP, 2005a;Smith, 1998; Wright et al., 2005
Cercospora sp. Ascomycetes/Mycosphaerellales	US (Altier, N., 1994; Caruso et al., 1995; Farr et al., 2005; Milholland, 1984)	S (Caruso et al., 1995; Milholland, 1984)	Yes	No	Caruso et al., 1995; Farr et al., 1989; Farr et al., 2005; Milholland et al., 1984; Scherm, 1999, USDA-APHIS-PPQ, 2004
Cladosporium sp. Ascomycetes/ Mycosphaerellales	US (Altier, N., 1994; CPC, 2004;Caruso et al., 1995; Farr et al., 2005)	L, S, Fl, F (Caruso et al., 1995)	Yes	Yes[24]	Andrade et al., 1993, Farr et al., 1989; Farr et al., 2005; Gonzalez, 2005, MGAP, 2005a
Colletotrichum acutatum Simmonds ex Simmonds Ascomycetes / Phyllachorales	US (Altier, N., 1994; CPC, 2004; Farr et al., 2005)	L, B, F (Caruso et al., 1995)	No	Yes	Caruso et al., 1995; Cline, 1997; Cline et al., 2005; Farr et al., 2005; USDA-APHIS-PPQ, 2004

[24] Not analyzed further, see text in Section 2.5, which follows this table.

Table 4. Pests associated with commodity (in any country)					
Pest	**Geographic Distribution[1]**	**Plant Part Association [2]**	**Quaran-tine Pest[3]**	**Follows Pathway**	**Host association**
Colletotrichum gloeosporioides (Penz.) Penz. & Sacc.[anamorph] (= *Glomerella cingulata*) Ascomycetes / Phyllachorales	US (Betucci, L. et al., 2004; CPC, 2004; Caruso et al., 1995; Farr et al., 2005)	L, B, F (Caruso et al., 1995; Milholland et al., 1984)	No	Yes	Buzeta, 1997; Caruso et al., 1995; Farr et al., 2005; Fernandez et al., 2005a; Garcia Salazar, 2002; Johnson et al., 2003; Midwest Small Fruit Pest Management Handbook, 2004; SAG, 2005; Strik, 2005; Wright et al., 2005
Colletothrichum sp. Ascomycetes / Phyllachorales	US	L, B, F[25] (Horst, 2001)	Yes	Yes[26]	USDA-APHIS-PPQ, 2004, PIN309, 2005
Coniothyrium sp. Ascomycetes/ Pleosporales	US (Farr et al., 2005; Weingartner and Klos, 1974)	L, S Weingartner and Klos, 1974	Yes	No	Farr et al., 2005; PIN309, 2005; USDA-APHIS-PPQ, 2004, Weingartner and Klos, 1974
Epicoccum nigrum. Link Anamorphic Ascomycetes	US (Betucci, L. et al., 2004; CPC, 2004; Farr et al., 2005)	L, F[27] (Guerrero et al., 1993; Guerrero, 2000; Horst, 2001)	No	Yes	Guerrero et al., 1993; Guerrero, 2000

[25] Association with host plant organs was evaluated at the genus level.
[26] Not analyzed further, see text in Section 2.5, which follows this table.
[27] *Epicoccum nigrum* may be a secondary invader (Horst, 2001). On fruits it causes post-harvest decay, acting as a saprophyte (Guerrero et al., 1993; Guerrero, 2000; Horst, 2001).

Table 4. Pests associated with commodity (in any country)					
Pest	**Geographic Distribution[1]**	**Plant Part Association [2]**	**Quaran-tine Pest[3]**	**Follows Pathway**	**Host association**
Epicoccum sp. Anamorphic Ascomycetes	US (Farr et al., 2005; Gonzalez et al., 2005; Weingartner and Klos, 1974)	L, S, F[28] (Gonzalez et al., 2005, MGAP, 2005a; Horst, 2001; Weingartner and Klos, 1974)	No	Yes	Farr et al., 1989; Farr et al., 2005; Gonzalez et al., 2005; MGAP, 2005a; Weingartner and Klos, 1974
Fusarium oxysporum Schlechtendahl Ascomycetes / Hypocreales	US (CPC, 2004)	R, S (SAG, 2005)	Yes[29]	No	SAG, 2005
Fusarium sp. Ascomycetes / Hypocreales	US (CPC, 2004; Farr et al., 2005; Weingartner and Klos, 1974)	R, S, L, F, Sd (Horst, 2001; Farr et al., 2005; Weingartner and Klos, 1974)	Yes	Yes[30]	Andrade et al., 1993; Farr et al., 2005; Fernandez et al., 2005a; Guerrero et al., 1993; Guerrero, 2000; Weingartner and Klos, 1974; Wright et al., 1998; Wright and Rivera, 2005; Wright et al., 2005

[28] Association with host plant organs was evaluated at the genus level. These pests cause post-harvest rot.
[29] Some pathovars of *Fusarium oxysporum* are present in the U.S., while others are not and are considered quarantine pests. As with pests identified to only the genus level, this pathogen will be considered a quarantine pest because the particular pathovar that was attacking blueberries may not be in the U.S.
[30] Not analyzed further, see text in Section 2.5, which follows this table.

Table 4. Pests associated with commodity (in any country)					
Pest	**Geographic Distribution[1]**	**Plant Part Association [2]**	**Quaran-tine Pest[3]**	**Follows Pathway**	**Host association**
Glomerella cingulata (Stonem.) Spauld. & Schrenk [teleomorph] *Colletotrichum gloeosporioides* (Penz.) Sacc. [anamorph] Ascomycetes / Phyllachorales Incertae sedis	US (CPC, 2004, Farr et al., 2005, Milholland et al., 1984)	R, S, Fl, F (Caruso et al., 1995; CPC, 2004; Milholland et al., 1984)	No	Yes	Bell et al., 1999; Caruso et al., 1995; CPC, 2004; Farr et al., 1989; Farr et al., 2005; SAG, 2005, USDA-APHIS-PPQ, 2004, Wright et al., 2005
Hainesia lythri (Desm.) Höhnel Ascomycetes / Helotiales	US (Farr et al., 2005)	L (Cuevas et al., 2003; SAG, 2005)	No	No	Cuevas et al., 2003; SAG, 2004; SAG, 2005
Penicillium expansum Link Ascomycetes / Eurotiales	US (Pianzolla, M. J. et al. 2004; CPC, 2004; Farr et al., 2005)	F[31] (CPC, 2004)	No	Yes	CPC, 2003; CPC 2004
Penicillium sp. Ascomycetes / Eurotiales	US (Farr et al., 2005)	F[32] (CPC, 2004)	No	Yes	Andrade et al., 1993; Farr et al., 2005; Guerrero et al., 1993; Guerrero, 2000; SAG, 2005
Pestalotia vaccinii (Shear) Guba (syn. *Pestalotia guepinii* Desmaz. var. *vaccinii* Shear) Ascomycetes/Xylariales	US (Caruso et al., 1995; Farr et al., 2005; Gonzalez et al., 2005)	S, L (Cuevas et al., 2003; Gonzalez et al. 2005)	No	No	Caruso et al., 1995; Cuevas et al., 2003; Farr et al., 1989; Farr et al., 2005; Gonzalez et al., 2005; MGAP, 2005a; SAG, 2004; SAG, 2005

[31] *Penicillium*, in general, causes post-harvest decay (Horst 2001).
[32] *Penicillium*, in general, causes post-harvest decay (Horst 2001).

Table 4. Pests associated with commodity (in any country)					
Pest	**Geographic Distribution[1]**	**Plant Part Association [2]**	**Quaran-tine Pest[3]**	**Follows Pathway**	**Host association**
Pestalotiopsis guepinii (Desm.) Stey. Syn *Pestalotia guepinii* Desm. Ascomycetes/Xylariales	US (Betucci, L. et al., 2004; Farr et al., 2005; Gonzalez et al., 2005; MGAP, 2005a)	L (Gonzalez et al., 2005; MGAP, 2005a)	No	No	Fernandez et al., 2005a; Fernandez et al., 2005b; Gonzalez et al., 2005; MGAP, 2005a; Wright et al., 2005
Pestalotiopsis sp. Ascomycetes/Xylariales	US (Farr et al., 2005)	L, F (PIN309, 2005)	Yes	Yes[33]	PIN309, 2005
Phoma sp. Ascomycetes/ Pleosporales	US (Farr et al., 2005; Weingartner and Klos, 1974)	L, S, F, Sd (Farr et al., 2005; PIN309, 2005; Weingartner and Klos, 1974)	Yes	Yes[34]	Farr et al., 2005; PIN309, 2005; Weingartner and Klos, 1974)
Phyllosticta elongata G. J. Weidemann (teleomorph Botryosphaeria vaccinii (Shear) Barr) Ascomycetes/ Dothideales	US (Farr et al., 2005; Gonzalez et al., 2005; MGAP, 2005a)	L (Farr et al., 2005; Gonzalez et al., 2005)	No	No	Caruso et al., 1995; Farr et al., 1989; Farr et al. 2005; Gonzalez et al., 2005; MGAP, 2005a
Phyllosticta vaccinii Earle Ascomycetes/ Dothideales	US (Caruso et el., 1995; Gonzalez et al., 2005; MGAP, 2005a)	L (Caruso et al., 1995; Farr et al., 2005; Gonzalez et al., 2005)	No	No	Caruso et al., 1995; Cline, 1997; Farr et al., 1989; Farr et al., 2005; Gonzalez et al., 2005; MGAP, 2005a

[33] Not analyzed further, see text in Section 2.5, which follows this table.
[34] Not analyzed further, see text in Section 2.5, which follows this table.

Table 4. Pests associated with commodity (in any country)					
Pest	**Geographic Distribution[1]**	**Plant Part Association [2]**	**Quaran-tine Pest[3]**	**Follows Pathway**	**Host association**
Phytophthora sp. Oomycetes/Pythiales	US (Farr et al., 2005)	R (Wright et al., 2005; Wright and Rivera, 2005; Northwest Berry & Grape Network)	Yes	No	Fernandez et al., 2005a; Northwest Berry & Grape Network; Scherm 1999, SAG, 2005; Wright et al., 1998; Wright and Rivera, 2005; Wright et al., 2005.
Pucciniastrum vaccinii (G. Wint) Jorst (syn. P. myrtilli Arth.) Urediniomycetes Uredinales	US (Caruso et al. 1995; Farr et al., 2005; Gonzalez et al., 2005; MGAP, 2005a)	L (Caruso et al., 1995; Gonzalez et al. 2005)	No	No	Caruso et al., 2005; Farr et al., 2005; Fernandez et al., 2005a; Gonzalez et al., 2005; Hepp, 2005; MGAP, 2005a; Strik, 2005; Wright and Rivera, 2005.
Rhizoctonia solani [anamorph] *Thanatephorus cucumeris* (Frank) Donk [teleomorph] Basidiomycetes / Ceratobasidiales	US (CPC, 2004; Farr et al. 2005)	R (SAG, 2005)	No	No	Farr et al., 1989; Farr et al., 2005; SAG, 2005.
Rhizopus sp. Zygomycetes / Mucorales	US (CPC, 2004; Farr et al., 2005)	F[35] (Andrade et al., 1993; Guerrero et al., 1993)	No	Yes	Andrade et al., 1993; Guerrero et al., 1993
Rhizopus stolonifer (Ehrenb.) Vuill. Zygomycetes / Mucorales	US (CPC, 2004; Farr et al., 2005)	Fl, F (Guerrero, 2000; SAG, 2005;	No	Yes	Guerrero, 2000; SAG, 2005

[35] *Rhizopus*, in general, causes post-harvest rot (Horst 2001).

Table 4. Pests associated with commodity (in any country)					
Pest	**Geographic Distribution[1]**	**Plant Part Association [2]**	**Quaran-tine Pest[3]**	**Follows Pathway**	**Host association**
Stemphylium botryosum Wallr. Ascomycetes/ Pleosporales	US (CPC, 2004; Farr et al., 2005; Gonzalez et al., 2005; MGAP, 2005a)	L, S, FL, F (Gonzalez et al., 2005; Guerrero et al., 1993; Guerrero, 2000)	No	Yes	Guerrero et al., 1993; Guerrero, 2000; Gonzalez et al., 2005; MGAP, 2005a
Stemphylium sp. Ascomycetes/ Pleosporales	US (CPC, 2004; Farr et al., 2005)	S, F (Andrade et al., 1993; Fernandez et al., 2005a; Wright et al., 2005)	Yes	Yes[36]	Andrade et al., 1993; Farr et al., 1989; Farr et al., 2005; Fernandez et al., 2005a; Wright et al., 2005
Ulocladium sp.	US (CPC, 2004; Farr et al., 2005; Gonzalez et al., 2005; MGAP, 2005a)	L (Gonzalez et al., 2005; MGAP, 2005a)	Yes	No	Gonzalez et al., 2005; MGAP, 2005a
Verticillium sp.	US (CPC, 2004; Farr et al., 2005; Gonzalez et al., 2005; MGAP, 2005a; Weingartner and Klos, 1974)	R, S (Farr et al., 2005; Gonzalez et al., 2005; SAG, 2005; Weingartner and Klos, 1974)	Yes	No	Farr et al., 2005; Gonzalez et al., 2005; MGAP, 2005a; SAG, 2005; Weingartner and Klos, 1974)
NEMATODES[37]					
Pratylenchus penetrans Filipjev & Schuurmans Steckhoven Pratylenchidae	US (Caruso et al., 1995; CPC, 2004)	R (CPC, 2004)	No	No	Caruso et al., 1995; CPC, 2004
Xiphinema americanum Cobb Xiphinematidae	US (Caruso et al., 1995; CPC, 2004)	R (CPC, 2004)	No	No	Caruso et al., 1995; CPC, 2004

5.

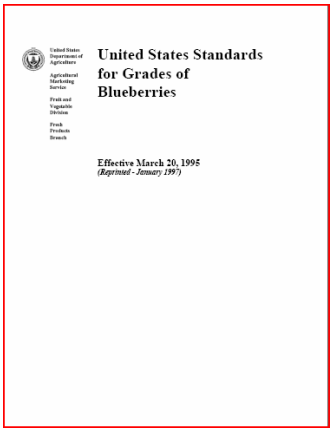
[36] Not analyzed further, see text in Section 2.5, which follows this table.

[37] Nematode taxonomic classification as in CPC (2004)

6. Pack House facilities (where applicable)

Pack house registration procedures/Organization: Packing houses are inspected and receive certification from the American Institute of Baking (AIB) aka. AIB International, Manhattan, Kansas. Information on AIB can be obtained at: http://www.aibonline.com Our Indian consultant, Raj Kapoor of Assocom, New Delhi also represents AIB-International interests in India.

Post-Harvest disinfestations/disinfection treatment methodologies (where applicable)


United States Standards for Grades of Blueberries

Effective March 20, 1995
(Reprinted - January 1997)

Inspection & sampling procedures/ grading/quality control etc: Blueberry fruits are typically inspected by color sorter and by manual labor, passed through metal detector, and packed in processing plants at 10-15 -^{0}C USDA standards and grades for blueberries can be located online at: http://www.ams.usda.gov/standards/bluebery.pdf

Packaging/labeling methods: Fresh blueberries are packed in plastic "Clamshell" packs of various sizes and weights depending on customer requirement.

Storage conditions/transport: Berries are cooled as soon as possible after harvest, ideally to O°C within 2 hours of harvest (but not later than 12 hours), to retain their optimum quality. The most efficient method is forced-air pre-cooling. Palletized field containers or packaged fresh berries are placed in front of a refrigerated air stream, (0°C) which rapidly removes the field heat and cools the berries to between 0°C and 4° within several hours. Fresh blueberries are cleaned, sorted and hand inspected then packed into plastic clamshell packs of various weights. Most likely our shipments to India will be 4.4 oz clamshells. The clamshells are placed into "Trays" and are placed on air shipping pallets and loaded into LD-3 air freight container containing 371 trays. Normally this is done the same day as harvest and cooling or soon after to keep berries as fresh as possible. We work with experienced freight forwarders with years of experience in shipping of perishable fruits.

- California Blueberries – shipped either from SFO (San Francisco International Airport) or LAX (Los Angeles International Airport.
- Oregon Blueberries – shipped from PDX (Portland International Airport.
- Washington Blueberries – shipped from SEA (Seattle-Tacoma International Airport.
- British Columbia Blueberries – shipped from YVR (Vancouver International Airport)

Our industry is well experienced in air freight shipments and have recently shipped to Thailand, Indonesia, Malaysia and Singapore.

7. Export programmes/policies/organisation involved

Export programs /organizations involved: Exportation of fresh blueberries from the West Coast of the USA will be sold by individual grower/packer/shippers to retail customers in India. At this time, we have an agreement from Big Bazaar, Delhi, Hyderabad, Mangalore and

Mumbai to receive test shipments during three different promotional periods. The North American Blueberry Council, a voluntary organization represents 80 percent of all of the highbush blueberry growers in North America and is involved in the preliminary work necessary to gain access for fresh blueberries into India including this document. The US Highbush Blueberry Council (USHBC) is a Federal Government Research and Marketing order funded by a check off from growers. USHBC conducts research on the health benefits of blueberries, and market development activities. One of these activities is designed to promote blueberries in export markets. Last year, we received a grant from the US government to help introduce blueberries to the Indian market, and these funds will be used to help launch the sales of fresh blueberries in India this summer. This will include sampling, recipes and consumer education.

Current phytosanitary certification procedures (standards/guidelines/specific protocols/pest declarations etc)/organization involved: Growers and packers work in accordance with guidelines of their respective University Cooperative Extension Service offices. Phytosanitary Certificates are issued by the state and federal department of Agriculture.

Note: All the data provided, as for as possible, should be supported by current information and technical references and validated/endorsed by the National Plant Protection Organisation of the exporting country.