FIGURE 16.1.1

GROWTH STAGES IN PLUM AND PRUNE

1. Dormant
2. Swollen bud
3 Bud burst
4. Green cluster
5. White bud
6. Bloom
7. Petal fall
8. Fruit set

16 General Pest Management Considerations - Plums and Prunes

16.1 Diseases

Bacterial Spot (*Xanthomonas arboricola* pv. *pruni*)

• Biology & Cultural

Bacterial spot can be devastating to plums and prunes. Plum or prune varieties developed in drier climates and then grown in the more humid climate of New England are the most likely to be susceptible. This disease will be more severe in the warmer southern portions of New England, in wet years, in orchards with lighter (sandy) soils, and in windy orchard sites. The bacterial spot pathogen, *Xanthomonas arboricola* pv. *pruni* infects leaf scars at leaf drop and overwinters in infected twigs. Bacteria populations subsequently multiply during warm weather and ooze out during spring rains. Immature tissues are less susceptible to the bacterial infection, and as such, infections will not begin until petal fall/shuck split. Early season copper applications applied to manage bacterial blast are quite effective for controlling the bacterial spot populations, but also likely to induce phytotoxicity if one is not careful.

• Pesticide Application Notes

Unfortunately, there are no materials registered for bacterial spot on prunes and plums. Despite the effectiveness, do not make a dormant copper application for bacterial spot. Copper applications to manage bacterial blast are still allowed whether or not the planting has bacterial spot.

Black Knot

• Biology & Cultural

[1.1] Fungicide sprays will be relatively ineffective in controlling black knot unless old knots are pruned and removed or burned, preferably before bud break. Make pruning cuts at least 6–8 inches below visible swellings. Destroy wild plum and cherry trees along fence rows, for these are major sources of black knot inoculum.

[1.2] The most important period for black knot sprays is from white bud through shuck split. Black knot infection periods require rain and are most likely at temperatures above 55° F; thus, sprays are most likely to be beneficial under these conditions.

Refer to the reference materials list at the end of this publication for a Fact Sheet containing more details on the biology and management of this disease.

• Pesticide Application Notes

[1.3] Bravo is the most effective fungicide for black knot control. Topsin M is only moderately effective. Bravo is not labeled for use on plums after shuck split.

[1.4] If leaf spot has been a problem in previous years, include captan, sulfur, or Topsin M in each spray from petal fall until terminal growth stops. Pristine also controls leaf spot. A petal fall spray of Bravo is recommended if wet weather and inoculum availability favor black knot infection. This spray will also protect against early season brown rot infections of the green fruit.

[1.5] If black knot is present in the orchard or nearby, apply an appropriate fungicide in the first 2 cover sprays if weather conditions are favorable for infection (wet).

[1.6] Vangard may not be applied after bloom.

Brown Rot

• Biology & Cultural

[2.1] Blossom blight is most likely to be a problem when the weather is warm (above 60° F) and wet or when large numbers of fruit were not harvested the previous year. Blossom blight may also be a problem at lower temperatures if prolonged wetting periods occur. If these conditions do not occur, it is recommended that the white bud, bloom, and petal fall sprays be directed primarily at black knot. Bravo and Echo give superior control of black knot and will also control blossom blight.

Refer to the reference materials list at the end of this publication for a Fact Sheet containing more details on the biology and management of this disease.

• Pesticide Application Notes

[2.2] Captan may cause injury on Stanley and Japanese-type plums if used repeatedly in early season sprays.

[2.3] Some plum cultivars are very susceptible to brown rot for the first few wk after setting; therefore, the shuck split and first cover sprays are important for control of this disease unless the weather is very dry. Do not apply Topsin M without captan.

[2.4] Spray intervals should be shortened during wet periods and the last 3 wk before harvest, because this is when fruit are most susceptible to infection. Pristine and Orbit are the best materials for brown rot control if high disease pressure develops near harvest, because of their partially systemic and antisporulant activities.

[2.5] Note the label warning that Orbit may affect the size and shape of "Stanley" plums.

[2.6] Do not apply Quash to "Stanley" type plums.

Peach Scab

• Biology & Cultural

Peach scab can infect Japanese plum fruit in southern New England if spring weather is warm and wet and no fungicides are applied at shuck split and first cover. The disease is more common following a year when spring frosts caused a crop failure, because trees grown for an entire summer without fungicides are more likely to carry

peach scab infections the following year. Fungicides applied to control black knot are usually sufficient to control peach scab.

• Pesticide Application Notes

[3.1] Apply 2 or 3 sprays at 10–14-day intervals beginning at shuck split. Under light disease pressure, a single application of Bravo or Echo applied at shuck split may provide season-long control. Bravo and Echo cannot be applied after shuck split.

Perennial (cytospora, valsa) Canker

• Biology & Control

[4.1] Perennial canker can be serious on Japanese-type plums and some prune cultivars. Refer to the discussion on this disease under Peaches. Also, refer to the reference materials list at the end of this publication for a Fact Sheet containing details on the biology and management of this disease.

Phytophthora Root and Crown Rots

• Biology & Control

[5.1] Although plum rootstocks are relatively resistant to these diseases, Japanese-type plums that are planted on peach rootstocks are at the same risk as peach and apricot trees. Refer to the section on this disease under Peaches.

Refer to the reference materials list at the end of this publication for a Fact Sheet containing details on the biology and management of this disease.

16.2 Insects and Mites

Apple Maggot

• Biology & Cultural

Refer to the reference materials list at the end of this publication for a Fact Sheet containing details on the biology and management of this pest.

• Monitoring

[6.1] Suggested action threshold: 1 adult capture on yellow board or red sphere trap.

• Pesticide Application Notes

[6.2] Up to 3 sprays at 10-day intervals, beginning app. July 1 in southern New England. If Assail or Baythroid are used for other pests (e.g. oriental fruit moth, plum curculio), they should also control apple maggot.

European Fruit Lecanium Scale

• Monitoring

[7.1] 1 spray at the end of crawler hatch (mid-June), about 16–20 days after the 2nd plum curculio spray.

European Red Mite, Twospotted Spider Mite

• Biology & Cultural

Refer to the reference materials list at the end of this publication for a Fact Sheet containing details on the biology and management of this pest.

• Monitoring

[8.1] Suggested action thresholds:
Bud Burst—10% of spurs with eggs
Shuck Split and later—6 motile forms/leaf.

• Pesticide Application Notes

[8.2] Apply acaricides when mites first surpass threshold; do not apply Acramite, Envidor, Onager or Savey more than once; or Nexter or *Vendex more than 2 times per season. Use lower rate of Nexter for European red mite, higher rate for twospotted spider mite.

[8.3] Portal for non-bearing trees only.

Japanese Beetle

Biology and Culture

[9.1] Adults emerge from the soil between early July and mid-August to feed on numerous trees and shrubs. In plum trees, beetles devour the tissue between the veins, leaving a lace-like skeleton, and also feed on the surface of the fruit. Severely injured leaves turn brown and often drop. Adults are most active during the warmest part of the day and prefer to feed on plants that are fully exposed to the sun.

Pesticide Application Notes

[9.2] Although pheromone traps are available and can be hung in early July to detect the beetles' presence, they are generally NOT effective at trapping out the beetles. Fruit and foliage may be protected from damage by applying Sevin, Assail, *Leverage or Provado; repeated applications may be required. For best effectiveness and insecticide resistance management, the use of pre-mixes such as *Leverage should be reserved for those situations when the pest complex to be treated is appropriately matched to the combination of active ingredients and modes of action contained in the product.

Lesser Peachtree Borer, Peachtree Borer, American Plum Borer

• Biology & Cultural

Refer to the reference materials list at the end of this publication for Fact Sheets containing details on the biology and management of these pests. American plum borer can be a problem particularly in orchards adjacent to other stone fruit plantings.

• Biological & Non-chemical Control

[10.1] Hang pheromone ties at shuck split before moth flight begins. Pruning should be done before hanging dispensers. Use Isomate PTB-Dual at a rate of 150 per acre. Use a higher rate (200-250/A) for outside edges of border

blocks; areas that haven't been disrupted before and have high populations; and in blocks smaller than 5 acres. Isomate PTB-Dual is effective on both Peachtree Borer and Lesser Peachtree Borer.

• Pesticide Application Notes

[10.2] A single postharvest application of *Thionex or 3 sprays of *Asana or *Warrior to trunk and scaffold limbs against larvae: June 1–10, July 7–15, and August 1–10. *Baythroid and *Leverage not labeled for peachtree borer.
Suggested action threshold: 1st emergence of adults plus 8 days or 1-2 larvae or pupal cases/tree.

Oriental Fruit Moth

• Biology & Cultural

Refer to the reference materials list at the end of this publication for a Fact Sheet containing details on the biology and management of this pest.

• Biological & Non-chemical Control

[11.1] Pheromone disruption is economically justified if 2–3 sprays are normally applied, and if no other insecticide sprays are routinely needed for other pests after petal fall. For this reason, disruption may not be economical for the 1st brood, as plum curculio sprays at this time normally would also control oriental fruit moth. Pheromones should be applied in mid-June before initiation of the 2nd flight; the need for re-application depends on residual field life of specific formulations: Isomate-M 100, 90 days; Checkmate, OFM-F, 30 days. Insecticide sprays or a double rate of pheromones may be needed in border rows of orchards adjacent to sources of adult immigration or in other high pressure situations.

• Pesticide Application Notes

[11.2] Summer sprays should be timed to start approximately at the 10% hatch point, 175-200 DD (base 45° F) after the first adult catch of the second brood, with a second application in 10-14 days. In high pressure blocks, a final spray should be applied 2 wk before harvest to control late season larvae. Avaunt will provide suppression only. Altacor will provide suppression only against plum curculio. Intrepid not effective on plum curculio. For best effectiveness and insecticide resistance management, the use of pre-mixes such as *Leverage should be reserved for those situations when the pest complex to be treated is appropriately matched to the combination of active ingredients and modes of action contained in the product. Suggested action threshold: Avg. of >10 adults/week caught per pheromone trap.

Plum Curculio

• Biology & Cultural

Refer to the reference materials list at the end of this publication for a Fact Sheet containing details on the biology and management of this pest.

• Pesticide Application Notes

[12.1] Also effective against redbanded leafroller.

[12.2] Actara not effective on Oriental fruit moth. Do not apply Actara between the prebloom (swollen bud) and post bloom (petal fall) growth stages. For best effectiveness and insecticide resistance management, the use of pre-mixes such as *Leverage should be reserved for those situations when the pest complex to be treated is appropriately matched to the combination of active ingredients and modes of action contained in the product.

[12.3] Frequent applications (7–10-day intervals) of Surround and maximal coverage (minimum of 100 gal/A) are advised while there is active foliar growth.

Redbanded Leafroller

• Biology & Cultural

Refer to the reference materials list at the end of this publication for a Fact Sheet containing details on the biology and management of this pest.

• Monitoring

[13.1] Suggested action threshold: 10% infested terminals from petal fall to shucks off; 5% infested terminals in late August.

• Pesticide Application Notes

[13.2] Imidan applied as the 2nd plum curculio spray controls this pest. May also need a spray 3 wk before harvest.

Scales, including European Lecanium and San Jose Scale

Biology and Cultural

Refer to the reference materials list at the end of this publication for a Fact Sheet containing details on the biology and management of San Jose scale.

Pesticide Application Notes

[14.1] Apply oil against overwintering crawlers.

[14.2] One application 4-6 weeks after shuck split against hatching crawlers. Movento must be used with an organosilicone or nonionic spray adjuvant.

16.3 Storage Rots

[15.1] A postharvest treatment with Scholar SC via dipping, flooders, T-jet, or similar system for control of storage rots is recommended for fruit coming from orchards where sporulating brown rot was observed, or when one hopes keep fruit in cold storage for a few days prior to sale. Holding tanks in postharvest treatment equipment must have excellent agitation to keep fungicides in suspension. Solutions must be replenished regularly as directed on the product label. Never expose treated fruit to direct sunlight. This will cause the fungicide to break down.

16.4 Plum and Prune Spray Tables

Table 16.4.1 Pesticide Spray Table – Plums and Prunes.

Refer to inside back cover for key to abbreviations and footnotes

Pest		Product	Rate/100 gal	Rate/A	REI (hrs)	PHI (days)	Comments (see text)
Bud Burst							
European red mite, Scale insects		§oil	2 gal/100 gal		12	0	[8.1] [14.1]
White bud to Petal Fall							
Black knot		Bravo Ultrex 82.5 WDG	0.9-1.25 lb/100 gal	2.8-3.8 lb/A	12 hr/ 7days (E)	SS	[1.1, 1.2]
		or Bravo Weather Stik 6F	1.0-1.4 pt/100 gal	3.1-4.1 pt/A			[1.4]
		or other chlorothalonil formulations (see labels)					
	OR	Topsin M 70WP	5.3-8.0 oz/100 gal	1.0-1.5 lb/A	48	1	[1.4]
		or Topsin M 4.5F	6.7-10 fl oz/100 gal	20-30 fl oz/A	48	1	
Brown rot (blossom blight)		Bravo Weather Stik 6F	1.0-1.4 pt/100 gal	3.1-4.1 pt/A	12 hr/ 7days (E)	SS	[2.1]
		or other chlorothalonil formulations (see labels)					
	OR	Captan 50WP#	2 lb/100 gal	6.0 lb/A	24-96(E)	0	[2.2]
		or Captan 80WP	1.25 lb/100 gal	3.75 lb/A	24	0	
		or Captec 4L	1 qt/100 gal	3 qt/A	24	0	
	OR	Echo 720 6F	1.0-1.4 pt/100 gal	3.1-4.1 pt/A	12hr/7 days (E)	SS	
		or Echo 90DF	0.75-1.2 lb/100 gal	2.25-3.5 lb/A			
	OR	Elevate 50WDG	0.3-0.5 lb/100 gal	1.0-1.5 lb/A	12	0	
	OR	Orbit 3.6EC		4.0 fl oz/A	12	0	[2.5]
	OR	Pristine 38WDG		10.5-14.5 oz/A	12	0	[2.4]
	OR	Quash 50 WDG		2.5-3.5 oz/A	12	14	[2.6]
	OR	Rally 40 WSP	1.25-2.0 oz/100 gal	2.5-6.0 oz/A	24	0	
	OR	Scala 600SC		9.0-18.0 fl oz/A	12	2	
	OR	Vangard 75WG		5.0-10.0 oz/A	12	BL	
	OR	§Sulfur 95WP	5 lb/100 gal		24	0	
Leaf spot		(See comments)					[1.4]
Shuck Split							
Brown rot, Black knot, Peach Scab		Adament 50WG		4.0-8.0 oz/A	120	1	[2.3, 3.1]
	OR	Bravo Ultrex 82.5WDG	0.9-1.25 lb/100 gal	2.8-3.8 lb/A	12 hr/ 7days (E)	SS	
		or Bravo Weather Stik 6F	1.0-1.4 pt/100 gal	3.1-4.1 pt/A			
		or other chlorothalonil formulations (see labels)					
	OR	Captan 50WP	2 lb/100 gal	6.0 lb/A	24-96(E)	0	
		or Captec 4L	1 qt/100 gal	3 qt/A	24	0	
	OR	Topsin M 70WP	4 oz/100 gal		48	1	
		or Topsin M 4.5F	5 fl oz/100 gal		48	1	
		plus Captan 50WP	1.5 lb/100 gal		24-96(E)	0	
		or Captec 4L	1.5 pt/100 gal		24	0	

Table 16.4.1 Pesticide Spray Table – Plums and Prunes.

Refer to inside back cover for key to abbreviations and footnotes

Pest		Product	Rate/100 gal	Rate/A	REI (hrs)	PHI (days)	Comments (see text)
Shuck Split (continued)							
European red mite, Twospotted spider mite		Acramite 50 WS		0.75-1.0 lb/A	12	3	[8.2]
	OR	*Agri-Mek 0.15EC *plus* oil	2.5-5.0 fl oz/100 gal	10-20 fl oz/A	12	21	
	OR	Envidor		16.0-18.0 fl oz/A	12	7	
	OR	Nexter 75WS		4.4-10.7 oz/A	12	7	
	OR	Onager 1 EC		12-24 oz/A	12	28	
	OR	Savey 50DF		3.0-6.0 oz/A	12	28	
	OR	*Vendex 50WP		1.0-2.0 lb/A	48	14	
Oriental fruit moth, Plum curculio		Actara		4.5-5.5 oz/A	12	14	[12.2]
	OR	Altacor 35 WDG		3.0-4.5 oz/A	4	10	[11.2]
	OR	*Asana 0.66EC	2.0-5.8 fl oz/100 gal	4.8-14.5 fl oz/A	12	14	
	OR	Assail 30 SG		5.3-8.0 oz/A	12	7	
	OR	Avaunt 30 WDG		5.0-6.0 oz/A	12	14	
	OR	§Aza-Direct		1.0-2.0 pt/A	4	0	
		§Azatin XL Plus 3L		10-21 fl oz/A	4	0	
	OR	*Baythroid XL 1EC					
		for oriental fruit moth:		2.0-2.4 fl oz/A	12	7	
		for plum curculio:		2.4-2.8 fl oz/A	12	7	
	OR	Delegate 25WG		6.0-7.0 oz/A	4	7	
	OR	Imidan 70WP	0.75-1.0 lb/100 gal	2.1-4.25 lb/A	72	7	
	OR	Intrepid 2F		10.0-16.0 fl oz/A	4	7	[11.2]
	OR	*Leverage 2.7 SE		3.6-5.1 fl oz/A	12	7	[11.2]
	OR	Sevin XLR Plus, 4F		2-3 qt/A	12	3	
	OR	§Surround 95WP		25-50 lb/A	4	0	[12.3]
	OR	Pheromone disruption:					
		or §Checkmate OFM-F		1.3-2.9 fl oz/A			[11.1]
		or Checkmate OFM Dispenser		100-200 dispensers/A			
		or §Isomate-M 100		100 ties/A			
Peachtree Borer, Lesser Peachtree Borer		Pheromone disruption: Isomate PTB-Dual		150 ties/A			[10.1]
Additional Summer Sprays							
Black knot		Topsin M 70WSB	5.3-8.0 oz/100 gal	1.0-1.5 lb/A	48	1	
		or Topsin M 4.5F	6.7-10 fl oz/100 gal	20-30 fl oz/A	48	1	
Brown rot		Adament 50WG		4.0-8.0 oz/A	120	1	[2.4]
	OR	Captan 50WP	2.0 lb/100 gal	6.0 lb/A	24-96(E)	0	[2.2]
		or Captec 4L	1 qt/100 gal	3 qt/A	24	0	
	OR	Elevate 50WDG	0.33-0.5 lb/100 gal	1.0-1.5 lb/A	12	0	
	OR	Elite 45WP	2.0 oz/100 gal	4.0-8.0 oz/A	12	0	

Table 16.4.1 Pesticide Spray Table – Plums and Prunes.

Refer to inside back cover for key to abbreviations and footnotes

Pest		Product	Rate/100 gal	Rate/A	REI (hrs)	PHI (days)	Comments (see text)
Additional Summer Sprays (continued)							
Brown rot (*continued*)	*OR*	Indar 2F		6.0 fl oz/A	12	0	
	OR	Orbit 3.6EC		4.0 fl oz/A	12	0	[2.5]
	OR	Pristine 38WDG		10.5-14.5 oz/A	12	0	
	OR	Rally 40 WSP	1.25-2.0 oz/100 gal	2.5-6.0 oz/A	24	0	
	OR	§Sulfur 95WP	5 lb/100 gal		24	0	
	OR	Tebuzol 45DF	2.0 oz/100 gal	4.0-8.0 oz/A	120	0	
Apple maggot		Imidan 70WP	0.75-1.0 lb/100 gal	2.1-4.25 lb/A	72	7	[6.2]
European red mite, Twospotted spider mite		Acramite 50WS		0.75-1.0 lb/A	12	3	[8.2]
	OR	Envidor		16.0-18.0 fl oz/A	12	7	
	OR	Nexter 75WS		4.4-10.7 oz/A	12	7	
	OR	Onager 1 EC		12-24 fl oz/A	12	28	
	OR	Portal		2.0 pt/A	12	365	[8.3]
	OR	Savey 50DF		3.0-6.0 oz/A	12	28	
	OR	*Vendex 50WP		1.0-2.0 lb/A	48	14	
Japanese beetle		Assail 30 SG		5.3-8.0 oz/A	12	7	[9.2]
	OR	*Leverage 2.7SE		3.6-4.4 fl oz/A	12	7	
	OR	Provado 1.6F		4.0-.8.0 fl oz/A	12	7	
	OR	Sevin XLR Plus, 4F		2-3 qt/A	12	3	
Lecanium scale, San Jose scale		Esteem 35WP		4.0-5.0 oz/A	12	14	[14.2]
	OR	Movento 240SC		6.0-9.0 fl oz/A	24	7	
Lesser peachtree borer, Peachtree borer, American plum borer		*Asana 0.66EC	2.0-5.8 fl oz/100 gal	4.8-14.5 fl oz/A	12	14	[10.2]
	OR	*Baythroid Xl 1EC					
		for lesser peachtree borer:		1.4-2.0 fl oz/A	12	7	
		for American plum borer:		2.4-2.8 fl oz/A	12	7	
	OR	*Thionex 3EC	1 qt/100 gal	2.7-3.3 qt/A	48	7	
		or *Thionex 50WP	1.5 lb/100 gal	4.0-5.0 lb/A	96	7	
	OR	Pheromone disruption:					
		§Isomate PTB-Dual		150 ties/A			[10.1]
	OR	*Proaxis 0.5CS		2.6-5.1 fl oz/A	24	14	
	OR	*Warrior II		1.28-2.56 fl oz/A	24	14	
Oriental fruit moth		Pheromone disruption:					[11.1]
		or §Checkmate OFM-F		1.32-2.93 fl oz/A			
		or Checkmate OFM dispensers		100-200 dispensers/A			
		or §Isomate-M 100		100 ties/A			
	OR	Altacor 35 WDG		3.0-4.5 oz/A	4	10	[11.2]
	OR	*Asana XL 0.66EC	2.0-5.8 fl oz/100 gal	4.8-14.5 fl oz/A	12	14	
	OR	Assail 30SG		5.3-8.0 oz/A	12	7	
	OR	Avaunt 30 WDG		5.0-6.0 oz/A	12	14	
	OR	*Baythroid XL 1EC		2.0-2.4 fl oz/A	12	7	
	OR	Delegate 25 WG		6.0-7.0 oz/A	4	7	

Table 16.4.1 Pesticide Spray Table – Plums and Prunes.

Refer to inside back cover for key to abbreviations and footnotes

Pest		Product	Rate/100 gal	Rate/A	REI (hrs)	PHI (days)	Comments (see text)
Additional Summer Sprays (continued)							
Oriental fruit moth (*continued*)	*OR*	Imidan 70WP	0.75-1.0 lb/100 gal	2.1-4.25 lb/A	72	7	
	OR	Intrepid 2F		10.0-16.0 fl oz/A	4	7	
	OR	*Leverage 2.7 SE		3.6-5.1 fl oz/A	12	7	
	OR	*Proaxis 0.5CS		2.6-5.1 fl oz/A	24	14	
	OR	Sevin XLR Plus, 4F		2-3 qt/A	12	3	
	OR	*Warrior II		1.28-2.56 fl oz/A	24	14	
Redbanded leafroller		*Baythroid XL 1EC		2.4-2.8 fl oz/A	12	7	[12.1, 13.2]
	OR	Delegate 25 WG	6.0-7.0 oz/acre	4.5-7.0 oz/A	4	7	
	OR	SpinTor 2SC		4.0-8.0 fl oz/A	4	7	
		or §Entrust 80WP	1.25-2.5 oz/A	1.25-2.5 oz/A	4	7	
Control of Storage Disorders							
Storage rots		Scholar SC	16-32 fl oz/100 gal				[15.1]

Table 16.4.2. Plant Growth Regulator Use in Plums and Prunes

Refer to inside back cover for key to abbreviations and footnotes.

Timing	Product	Concentration	Rate of Formulated Product	Comments
Preharvest Fruit Drop Control				
1-2 weeks before anticipated harvest	ReTain	132 ppm	333 g/acre (1 pouch) (12 oz/100 gal)	Apply in sufficient water to ensure thorough but not excessive coverage. An organosilicone surfactant (12 oz/100gal) should be used with ReTain.