2020 Wild Blueberry Research & Extension Reports

January 2021

Annual Extension Report & Production Schedule Recommendations

Table of Contents

THE UNIVERSITY OF MAINE Cooperative Extension

Maine's Wild Blueberry Extension Program 2020

Content Created in 2020

Sprayer Calibration Course for Pesticide Credit (online only)
Real-time Wild blueberry Phenology Tracker
About Maine Wild Blueberries
Covid-19 Resource Page
Rake your Own Wild Blueberry Operations
Wild Blueberry Concentrations: Antioxidants, Vitamins, and Minerals
Post-Harvest Handling of Wild Blueberry

2019 to 2020 Website Analytics: Website usage before and after the January 2020 website revision.

	Number of Page Views			Average Time Spent		
	May to July		Change	Minutes		Change
	2019	2020	(%)	2019	2020	(%)
Total Page Views	**42,702**	**61,239**	**43%**	**2:31**	**2:47**	**11%**
Growing Blueberries from Seed	3,718	6,446	73%	20:01	23:30	17%
Wild Blueberry Homepage	2,879	2,344	-19%	1:44	1:12	-31%
Wild Blueberry Culture in Maine	2,108	1,921	-9%	9:00	10:23	15%
Broadleaf Weeds (Yellow Flowers)	1,279	2,778	117%	0:49	0:43	-12%
Wild Blueberry Planting Guide	1,040	1,699	63%	9:27	10:43	13%

Projects to look forward to in 2021

Development of a Wild Blueberry Production Guide
Research and Extension on Dual-Use Solar in Wild Blueberry
Research and Extension on Harvest Timing and Berry Quality

COVID-19 Virtual Planning	
April 21st	Resource Update with the DACF, DOL and FSA
May 4th	Q & A Panel with WBB Commission
May 13th May 14th July 14th	Harvest Planning and Discussions
April - June	Friday Coffee Hour
2020 Virtual Field Days	
July 9th	Weeds, Mulch & Foliar Fertility with Lily
July 16th	Insect IPM with Phil
July 23rd	Climate Change Impacts with John
July 30th	Disease IPM with Seanna
2020 In-Person Field Days	
October 6th	Washington County
October 7th	Mid-Coast Region
NEW 2020 FACT SHEETS:	
Fresh Pack Quality	
Antioxidant & Element Concentrations	
Rake Your Own Wild Blueberries	
NEW & UPDATED 2021 FACT SHEETS WILL INCLUDE:	
Wild Blueberries & Climate Change	
Restoring and Planting Wild Blueberry	
Updated Nutrient Management	
Updated Mummy Berry	




PRUNE YEAR MANAGEMENT SCHEDULE

APRIL

Plant Dormancy

Crop: Prune plants as close to the ground as possible via mowing or burning (in late fall post-harvest or spring prior to bud break). Apply pre-emergent fertilizer according to leaf sample analysis for N, P, K. IF phosphorus levels are low, MAP or DAP can be applied post ground thaw and prior to plant emergence or shortly after. N and K are critical nutrients for growth. Consider applying nitrogen in the form of ammonium sulfate and potassium in the form of SOP (sulfate of potash).

Weed: Apply sulfur according to soil recommendations (post ground thaw, prior to plant emergence). Spot-burn or spray weedy patches. Apply pre-emergent herbicides (ex. mesotrione) prior to blueberry emergence, when appropriate and according to the label.

Insect (May): Sweep for spanworm and flea beetle larvae especially in locations with these pests last year – manage early according to economic thresholds. Late emerging plants may indicate insect feeding from below the surface.

Disease: Burn pruning can decrease disease causing fungi surviving on stems and in the leaf litter. Spot burning plants after harvest with a lot of mummy berries can decrease disease in the next crop year.

MAY

Shoot Emergence

JUNE

Vegetative Growth

Crop: Scout for pests, apply mulch to spots or whole field for water retention, plant spread, weed suppression.

Weed: Pull or cut weeds above blueberry canopy before they go to seed or cut weeds to base. If needed, apply selective post-emergent herbicides (ex. mesotrione, clethodim) to weeds under 5” in height before weed flowering.

Insect: Sweep for spanworm and flea beetle larvae – manage according to thresholds. Scout and trap for thrips. Burn patches early or spot treat according to recommendations.

Disease: Consider applying fungicides for leaf spots if high levels of leaf loss has occurred in the past.

JULY

Vegetative Growth to Tip Dieback

AUGUST

Bud Development

Crop: Take leaf samples at the tip-dieback stage for nutrient analysis. Take soil samples for pH analysis. Apply mulch to bare spots to encourage wild blueberry growth and suppress weeds.

Weed: Pull, mow, cut weeds above blueberry plants before they go to seed. Cut woody weeds to base 3 times throughout the season. If needed, apply selective post-emergent herbicide or wipe weeds taller than the blueberry with a nonselective post-emergent herbicide.

Insect (July): Sweep for adult flea beetle and scout for red-striped fireworm larvae, manage according to economic thresholds.

Disease: Look for symptoms of leaf spots and note the types. Check lower leaves for Valdensia and Exobasidium leaf spots which may need further control measures. Avoid traveling through areas with Valdensia leaf spot (esp. in wet conditions).

FALL

Bud Hardening and Leaf Drop

Crop: Leaf drop occurs naturally after a killing frost or pre-maturely due to leaf spot diseases.

Weed: Pull, mow, cut weeds above blueberry plants before they go to seed. Cut woody weeds to the base. If needed, wipe nonselective post-emergence herbicides on weeds taller than blueberries.

CROP YEAR MANAGEMENT SCHEDULE

APRIL	MAY	JUNE
		
Plant Dormancy and Bud Swell	**Bud Break, Leaf Emergence, Early Bloom**	**Petal Fall and Green Fruit**

Crop (May-June): Place beehives in field at 10% bloom. Remove beehives when bloom is complete and before spraying pesticides. Take soil samples to measure reduction in soil pH from prune year .

Weed (April): If needed, apply a selective herbicide to dormant blueberry plants or prior to bloom and prior to or after weed emergence (ex: mesotrione (Callisto® 60d PHI) Poast and Select Max < 60d PHI). **Weed (June):** Pull, mow, and cut weeds, when possible. If needed, apply a selective post-emergent grass herbicide to grasses 4-6" in height.

Insect (May-June): Sweep for spanworm larvae and flea beetle larvae and mark infestation locations for control next spring (prune). **Insect (June):** Manage spanworm and flea beetle larvae according to economic thresholds as needed and observe bee cautions. Place blueberry maggot fly and SWD traps in field at the end of June.

Disease (April): Examine mummy berry plots for germination and monitor plant development. **Disease:** Use mummy berry reports and AgriNet to determine timing and necessity of fungicide applications. If needed, apply fungicide targeting Monolina infection (at approx. 30% flower buds at F2). Monitor early blooming clones for Botrytis in May (manage if confirmed). If fungicides are necessary for leaf spot control, apply after bloom and in accordance with pre-harvest intervals.

JULY	AUGUST	FALL
		
Fruit Coloring	**Ripening, Followed by Fruit Drop**	**Leaf Drop**
Crop: Irrigate if possible. Water availability is critical for nutrient uptake and therefore fruit expansion. Harvest when the majority of fruit is ripe (end of July - end of August). Harvest may continue into September if SWD is not present, temperatures are cool, and crop is large. **Insect:** Monitor blueberry maggot fly and SWD and manage according to economic thresholds and preharvest intervals. Perimeter treatments are effective and economical for both BMF and SWD. Stake out thrip infested areas for delayed burning or spot treatment next year (prune). **Disease:** Monitor for leaf spot diseases, esp. Valdensia leaf spot on lower leaves and Exobasidium leaf spot on leaves and ripening fruit. Mark areas with Valdensia and Exobasidium for future treatment. Avoid harvesting or traveling through areas with Valdensia (esp. in wet conditions). Note clones with lots of mummy berries for possible treatment after harvest.		**Crop:** Prune plants by mowing or burning after first frost or until snowfall. **Weed:** Fall is a good time for weed management. Wipe weeds taller than the blueberry with post-emergent herbicides until leaf drop. Bunchberry control may be applied until first frost. **Insect:** Monitor blueberry maggot fly and SWD and manage according to economic thresholds, as needed. **Disease:** Spot burning plants and leaf litter with a lot of mummy berries (white berries seen in picture above) after harvest can decrease disease in the next crop year.

WILD BLUEBERRY 2021 MANAGEMENT RECOMMENDATIONS AND THRESHOLDS

MANAGEMENT			RECOMMENDATIONS
TYPE	TARGET	TIMING	
Pruning, Mow or Burn.	Crop Health. Pest pressure (if burning).	Fall or Spring following the crop-year (harvest). Between crop-year and prune-year.	Pruning every other year, by fire or mowing, stimulates production. Burn pruning aids in pest management by reducing weed seeds in the field, killing fungal overwintering structures and insect pests overwintering in the soil. However, burning too frequently or too hard can burn off precious organic matter and therefore we recommend burning every few cycles and learning from experienced growers.
Sulfur	Weed Reduction (especially grasses).	April to May (post ground thaw, prior to plant emergence). Prune-year.	Take soil samples to be analyzed for soil pH. Reduce soil pH with 90% elemental sulfur if pH is above 4.0. Every 100 lbs of sulfur/A will reduce the soil pH by 0.1 pH units. Do not exceed 800 lbs./A of sulfur in one year. Do not apply sulfur to frozen soil, saturated soil, or wet leaves.
Mulch	Weed Reduction and Soil Water Retention	Prune-year.	Apply mulch 2" to 4" deep in bare spots to encourage wild blueberry growth and suppress weed emergence for the following year. Some growers apply a thinner layer of mulch to whole fields to build organic matter for water retention. Use**:** bark, woodchips, shavings, sawdust, peat or sand.
Fertilizing	Crop Health.	April to May (post ground thaw, prior to plant emergence). Prune-year.	Take leaf samples for nutrient tests at tip-dieback stage. Apply fertilizer according to leaf sample analysis for N, P, K. IF phosphorus levels are low, MAP or DAP can be applied post ground thaw and prior to plant emergence or shortly after. N and K are critical nutrients for growth. Applying nitrogen in the form of ammonium sulfate and potassium in the form of SOP (sulfate of potash), should be considered moving forward.
Pollination	Crop Health. Fruit set.	May to June of the crop-year.	Place beehives in the field at about 10% bloom. Avoid any pesticide applications while bees are in the field or during pollination (observe bee cautions on labels). Encourage native pollinators (bumble bees and other beneficial insects) by planting wildflower (pollinator) plots.
Monitor Fruit set	Crop Health.	June to July of the crop year.	Blueberry yield is an indicator of pollination. Estimating fruit set will allow you to judge if your bee densities are adequate to reach the highest yield potential. Methods are simple, see Estimating Your Pollinator Force factsheet.

PEST-SPECIFIC THRESHOLDS AND RECOMMENDATIONS

PEST TYPE	PEST	SCOUTING	THRESHOLDS & RECOMMENDATIONS
Weed	Broadleaf	Abundant earlier in the season.	**Cultural:** Sulfur. Burn. Mulch. Top or pull prior to seed set. **Chemical:** Apply registered pre- or-post-emergent herbicides such as mesotrione and clethodim. **For organic weed management,** consider wiping tall broadleaf weeds with OMRI approved herbicides and managing grasses with soil pH reduction.
	Grasses	Persistent later in the season.	
	Woody	Persistent throughout the season.	**Cultural:** Cutting clumps of woody weeds such as birch, maple and willow to ground level will suppress growth. For lasting suppression cut once in June, July, and August of the prune year. **Chemical:** Stumps may be wiped with nonselective herbicide following cutting to prevent regrowth.

PEST TYPE	PEST	SCOUTING	THRESHOLDS & RECOMMENDATIONS
Disease	Mummy berry (*Monilinia*)	April – June: Monitor mummy berry plots for development and death of cups and monitor plants for bud development. Consider temperatures and length of time of leaf wetness to determine the risk that Monilinia infection has occurred (use the MB forecast method). Primary infections of leaf and flower buds can occur for several weeks following bud-break if conditions are suitable.	**Cultural:** Burn pruning and efficient harvesting techniques. Use techniques to reduce the number of infected fruits on the ground by burning or disposing of winnower refuse. Scout fields around harvest for plants with lots of mummy berries. Spot burning the leaf litter after pruning can decrease overwintering mummy berries. **Chemical:** Fungicide applications may be used for primary infections when at least 30 to 40% of the flower buds are at the crown stage (F2, see page 126). Fungicides may be applied before infection periods or some others within 72 hours of an infection period. Once cups are no longer present in a field, fungicide applications are no longer effective. Apply all fungicides in accordance with bee cautions.
	Blossom Blight (*Botrytis*)	May – June: infection occurs on almost open and open blossoms during extended wet periods if the fungus is present in the field. Monitor and scout early blooming clones and weeds, particularly red sorrel, for Botrytis symptoms.	**Cultural:** Avoid irrigating during bloom when water can stay on the plants. Keep weeds under control in the field, particularly red sorrel, since it can get infected and act as source of spores. **Chemical:** Blossoms can also be killed by *Monilinia* (mummy berry disease) or frost, so determine the cause of blossom death before applying fungicide. Do not apply fungicides unless you are sure you have *Botrytis* and it is likely to cause crop loss. Avoid applying during pollination when bees are in the field.
	Valdensia Leafspot	Large brown, round lesion on leaves causing early leaf drop from June to July. Spores can be produced following a 3-4-day wet-period May to early June.	**Cultural:** hard burn to destroy all leaf litter within 10 feet of infected areas. Do not enter the field when it is wet. Flag infected areas so no one walks through it or moves equipment through it (inc. blueberry boxes). **Chemical:** There are few registered fungicides for this disease, and they will only suppress the disease and will not remove it from your field.
	Blueberry Spanworm	April: larvae start feeding. June - July: feeding continues. Larvae pupate in litter. Mid-June: Adults begin to emerge. **Scout using sweep net.**	**Cultural:** Eggs can be targeted with burn pruning. **Chemical:** Treat based on action threshold. ONLY larvae can be targeted during the crop year. **Threshold:** using a 12" sweep net, Crop Year 10+ larvae per 10 sweeps, Prune Year 3+ larvae per 10 sweeps.
Insect	Flea Beetle	May – June: Larvae are present (typically during bloom). Early July: Adults emerge and remain through late summer. **Scout using sweep net.**	**Cultural:** Eggs can be targeted with burning (litter must be ignited). **Chemical:** Both larvae and adults can be targeted for control. Adults disperse within 2 weeks of emergence. Spray as needed when larval counts (mid-June to early July) meet threshold. **Threshold:** 50+ larvae per 10 sweeps with a 12" sweep net.
	Thrips	May to Early June: Larvae feeding. Late July to Early August: Adults found within leaf galls. Late Summer: Adult females (and some males) move to the soil. **Scout using yellow sticky cards.**	**Cultural:** Delayed burning of infected areas in the prune year (as late as mid-July). **Chemical:** Effective as spot treatments in early prune-year (stake out affected areas in crop-year). Make first application when leaves are 1/4 inch to 1/2-inch-long. Repeat when 1/2 inch to 1 inch. **Timing is critical**. Yellow sticky cards may be used to monitor for blueberry thrips for more efficient timing of applications
	Blueberry Maggot fly	Late June to Early July: Flies emerge. Adults live for ~30 days. Mid-July: Maggots appear in berries. **Scout using yellow sticky cards.**	**Cultural:** Harvest early. **Chemical**: Adults (the fly) are the target of control. Spot treatments work if a grid of traps is used. Perimeter field treatments (25ft from edge) are effective and economical. *Never apply insecticides when less than 3-5% of crop have ripened (July).*
	Spotted Wing Drosophila (SWD)	SWD is a mid to late season pest. The life cycle is completed in 21 days. July-August: Females will lay eggs in red and blue maturing fruit.	**Cultural:** Harvest early (prior to Aug. or upon trapping the FIRST Male). **Chemical:** Apply insecticides based on action thresholds. Perimeter field treatments show preliminary efficacy. **Threshold**: Risk with average cumulative males/trap with at least 3 traps: 0.5 = Low, 3.5 = Moderate, 7 = High.