Summary of Materials for Management of Mummy Berry of Blueberry from 1995 to 2013.

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Frequent spring rains from bud break through bloom encourage the development of mummy berry of blueberry throughout the Pacific Northwest. Control of mummy berry can be difficult using either conventional or organic tactics. Materials typically used by organic growers have resulted in less effective protection than products available to conventional growers. The objective of this report is to summarize, in a simple way, various mummy berry trials conducted in Oregon from 1995 to 2013. A summary of organic materials from trials conducted throughout the USA is also included.

Many of the trials were conducted at OSU's Botany and Plant Pathology Field Laboratory located across the Willamette River from Corvallis, OR on the cultivar Berkeley. Data from many organic trials were obtained from published reports conducted in Michigan, Georgia, New Jersey and North Carolina on many different cultivars of blueberry. Results have been averaged across cultivars and regions unless indicated otherwise.

Materials were generally applied from bud break through bloom on 7 to 14 day intervals. One set of trials from Michigan used only a single application at delayed dormant when bud scales swell but floral tissue has not yet emerged. Trials generally evaluated both primary and secondary symptoms. Primary symptoms include the collapse of floral trusses and developing vegetative shoots. Secondary symptoms include the browning and shriveling of berries just before harvest. Trials in Oregon evaluated secondary symptoms on green fruit by cutting berries in half to look for developing fungal sclerotia.

Trial results from multiple sites and years are summarized in Table 1 for synthetic materials, Table 2 for organic materials and Tables 3 for organic materials tested once. The number of times a material has been evaluated is indicated by the "number of trials" column. The more times a product is evaluated (or the higher the number of trials) the more confidence one can have in the summary statistic presented.

Trial results are evaluated relative to the non-treated control and expressed on a percentage basis. For example, if the nontreated control had 20% fruit with mummy berry and a certain treatment had 10% mummy berry then the percent control would be calculated as (1 - (10/20)) x 100 = 50% control. It should be noted that this approach does not focus on rates, timing, weather or other factors highly important for interpretation of the data. Unfortunately, there are no statistical comparisons possible between any of these materials given the way this data was summarized. It is not possible to say that 64% control is or is not significantly different from 52% control.

In general, most materials are more effective on preventing primary than secondary infections. Luna Tranquility (group 7+9), Quash (group3), Pristine (group 7+11) and Proline (group 3) have good active on both phases of this disease. The organic materials Actinovate (biological), Regalia (plant extract) and potentially elemental sulfur can be useful for primary infection. None of the organic materials appear effective on secondary infection (although the experimental design with non-treated controls may overly influence the data).

Future research should focus on generating more data for elemental sulfur, timing of organic materials and testing products for use during bloom.

Table 1. Materials evaluated in Oregon.

Material**	**Primary Infection (flowers and shoots)**		**Secondary Infection (mummy berry)**	
	# of Trials	**% Control**	**# of Trials**	**% Control**
Funginex	8 (10)	70	5 (5)	66*
Orbit or Tilt	12 (14)	80	3 (7)	41
Indar	13 (16)	77	5 (8)	66
Proline	3 (3)	98*	2 (2)	99*
Quash	13 (16)	79	9 (9)	89*
Quash alt Group11	4 (4)	96*	2 (2)	92*
Abound	2 (4)	39	2 (2)	45*
Pristine	5 (5)	93*	3 (3)	83*
Elevate	2 (4)	61	2 (2)	51*
Captan	1 (4)	26	2 (2)	48*
CaptEvate	6 (6)	70*	1 (3)	21
Fontelis	6 (6)	94*	4 (4)	44*
Luna Tranquility	1 (1)	88*	1 (1)	96*
Switch	2 (2)	82*	0 (1)	19
Topsin	1 (2)	31	0 (1)	0+
Ziram	0 (2)	35	1 (1)	35*
Omega	4 (4)	80*	2 (2)	45*

* Significantly different than the non-treated control.

**Materials were generally used during the mummy berry season from bud break through bloom using 14 day intervals.

0+ = Treatment had more disease than non-treated control plots.

# of Trials = number of trials significantly different than the non-treated control outside parenthesis (total number of trials inside parenthesis).

Table 2. Organic materials used in multiple trials throughout the USA.

Material**	**Primary Infection (flowers and shoots)**		**Secondary Infection (mummy berry)**	
	# of Trials	**% Control**	**# of Trials**	**% Control**
Actinovate AG	7 (7)	61*	4 (5)	44
Actinovate + Regalia	0 (1)	31	0 (1)	0+
Regalia *** Oregon Data	6 (6)	64*	2 (3)	24
Regalia All Regions	7 (9)	52	2 (5)	18
Serenade Oregon Data	4 (15)	25	1 (8)	12
Serenade All Regions	5 (18)	36	2 (11)	21
Serenade + Copper hydroxide	0 (2)	28	0 (1)	2
Serenade Optimum 7 day intervals	1 (1)	47*	1 (1)	35*

* Significantly different than the non-treated control.

**Materials were generally used during the mummy berry season from bud break through bloom using 7 to 14 day intervals.

***Minor phytotoxicity – some necrosis on blooms and resetting on fruit.

Table 3. Organic materials used in just one trial throughout the USA.

Material	**Application Information****	**Primary Infection (flowers and shoots) % Control**	**Secondary Infection (mummy berry) % Control**
Botector WP	7 day intervals	18	31*
Cuprofix at 3 lb/A	Delayed Dormant	81*	-----
Kocide 2000 at 5lb/100 gal	Season Long	24	0+
Sulfur 6L at 15 pt/A	Delayed Dormant	69*	-----
Sulfur 6L at 10 pt/A	Season Long	95*	15
Lime Sulfur (29%) at 2 gal/100 gal	Season Long	36	0+
Lime Sulfur (27%) at 1 gal/A	Delayed Dormant	83*	-----
Lime Sulfur (27%) at 1 gal/A	Season Long	Phyto	-----

* Significantly different than the non-treated control.

**Materials were generally used during the mummy berry season from bud break through bloom using 7 to 14 day intervals. Delayed dormant is when bud scales have swollen but floral tissue has not yet emerged.

0+ = Treatment had more disease than non-treated control plots.