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# NUTRIENT MANAGEMENT PLAN

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## **BERRYGOOD FARMS LTD**

Hugh Mann  
23072 and 23500 64th Avenue  
Langley, British Columbia

Prepared for the 2024 season, dated March 15, 2024

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## EMERGENCY PROCEDURES & CONTACT INFORMATION

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In the event of a spill, the following actions should be taken:

1. Stop the source of the spill/leak
  - Stop and turn off all pumps, valves, and siphons from the structure
  - Move liquid fertilizer into another structure if necessary
  - Plug or close the source of the spill/leak if possible
2. Contain the spill/leak
  - Prevent the movement of liquid fertilizer across the soil surface by constructing an earthen berm using agricultural equipment, such as backhoes or front-end loaders on tractors
  - Try to prevent entry into water bodies, ditches, or seasonally-high water tables
  - Plug drainage intakes and tile drain outlets
  - Contact any contractors and/or equipment operators that may assist in containing the spill/leak (see the contact table below)
3. Report the spill/leak to the Provincial Emergency Program (PEP)/Emergency Management British Columbia (EMBC)
  - If spill/leak is greater than:
    - 50 kg of granular fertilizer
    - 50 L of liquid fertilizer
    - 200 kg of solid manure
  - Be prepared to provide:
    - The contact information for:
      - The individual making the report
      - The responsible person in relation to the spill
      - The owner of the substance spilled
    - The date and time of the spill
    - The location of the spill site
    - A description of the spill site and the surrounding area
    - A description of the source of the spill
    - The type and quantity of the substance spilled
    - A description of the circumstances, cause, and adverse effects of the spill
    - Details of any actions taken and planned to contain the spill/leak
4. Clean up the spill/leak
  - If possible, pump the contained liquids into a functional storage facility
  - Use absorbent materials to soak up the liquid fertilizer (e.g., sawdust mulch, sand, soil amendments)
  - Check tile drains and other drainage pipes/pathways for contamination (use a pump to clear out contaminated lines if necessary)
5. Review the [Spill Reporting Factsheet](#) and document the spill/leak and actions taken

Name	Type of contact	Phone number
Provincial Emergency Program (PEP)/Emergency Management British Columbia (EMBC)	Spill Reporting	1-800-663-3456
	Municipality contact	
	Fire Department	
	On-farm Equipment Operator	
	Excavation Contractor	
	Manure Hauler	
	Septic Tank Pumping Truck	
	Neighbour	
	Neighbour	
	Neighbour	

\*In the event of other emergencies, call 911 immediately.

## APPLICATION SCHEDULE SUMMARY

Field: Duke (2012)		Area: 17.9 acres	Crop: Blueberry
Nutrient Source	Application Timing	Method	Rate
Ammonium sulphate (21-0-0-24S)	April 2024	Banded	300 lb/ac
Sulphate of potash (0-0-50-17S)	April 2024	Banded	100 lb/ac
Liquid urea (23-0-0)	May 2024	Fertigation	40 L/ac
Liquid urea (23-0-0)	June 2024	Fertigation	40 L/ac
Liquid urea (23-0-0)	July 2024	Fertigation	40 L/ac
Liquid urea (23-0-0)	August 2024	Fertigation	40 L/ac

Field: Reka (2017)		Area: 24.6 acres	Crop: Blueberry
Nutrient Source	Application Timing	Method	Rate
Urea (46-0-0)	April 2024	Banded	150 lb/ac
Sulphate of potash (0-0-50-17S)	April 2024	Banded	100 lb/ac
Liquid urea (23-0-0)	May 2024	Fertigation	25 L/ac
Liquid urea (23-0-0)	June 2024	Fertigation	25 L/ac
Liquid urea (23-0-0)	July 2024	Fertigation	25 L/ac
Liquid urea (23-0-0)	August 2024	Fertigation	25 L/ac

Field: Calypso (2021)		Area: 39.0 acres	Crop: Blueberry
Nutrient Source	Application Timing	Method	Rate
18-9-9	April 2024	Banded	100 lb/ac
Liquid urea (23-0-0)	May 2024	Fertigation	30 L/ac
Liquid urea (23-0-0)	June 2024	Fertigation	30 L/ac
Liquid urea (23-0-0)	July 2024	Fertigation	30 L/ac
Liquid urea (23-0-0)	August 2024	Fertigation	30 L/ac

Field: Meeker (2010)		Area: 24.3 acres	Crop: Raspberry
Nutrient Source	Application Timing	Method	Rate
Custom (Dry) 15-5-15	April 2024	Banded	200 lb/ac
Liquid urea (23-0-0)	May 2024	Fertigation	15 L/ac
Liquid urea (23-0-0)	June 2024	Fertigation	15 L/ac
Liquid urea (23-0-0)	July 2024	Fertigation	15 L/ac

Field: Cascade Harvest (2020)		Area: 18.6 acres	Crop: Raspberry
Nutrient Source	Application Timing	Method	Rate
Custom (Dry) 15-5-15	Spring 2024	Broadcast, not incorporated	4 yards <sup>2</sup> /ac
Liquid urea (23-0-0)	May 2024	Fertigation	25 L/ac
Liquid urea (23-0-0)	June 2024	Fertigation	25 L/ac
Liquid urea (23-0-0)	July 2024	Fertigation	25 L/ac

## FARM DESCRIPTION

BerryGood Farms Ltd is a raspberry and blueberry farm located at 23072 64th Street, and 23500 64th Street, Langley, BC. The farm is owned by Hugh Mann, and operated by himself along with his partner and two sons. The Mann's also employ help from their immediate and extended family during the busy seasons when necessary.

### LOCATION

As defined by the Agricultural Environmental Management Code of Practice (AEM Code), the farm is located in the following high-risk areas:

#### VULNERABLE AQUIFER RECHARGE AREA:

Starting July 15, 2024, all horticulture operations  $\geq 5$  ha, will require a nutrient management plan if post-harvest nitrate soil tests are greater than or equal to 100 kg N/ha (89 lb N/ac) for any field.

#### PHOSPHORUS-AFFECTED AREA:

Starting July 15, 2024, all agricultural operations  $\geq 5$  ha, will require a nutrient management plan if soil test phosphorus levels are greater than or equal to 200 ppm (Kelowna extractant) for any field.

#### HIGH-PRECIPITATION AREA:

As the farm is located in a high-precipitation area, nutrient applications are prohibited during November, December, and January. Additionally, an application risk assessment must be completed prior to application in October, February, and March.

### FARMSTEAD AND CROP PRODUCTION AREAS

Farm Details	Total Acreage	Spreadable Acreage
Total Farm Size	219.2	-
Blueberry Production	81.5	81.5
Raspberry Production	42.9	42.9
<b>Total Crop Acreage</b>	<b>124.4</b>	<b>124.4</b>

Spreadable area is the total crop production area that can receive nutrient applications. Minimum setbacks for applying nutrient sources adjacent to watercourses is specified at 1.5 m for commercial fertilizer, or 3 m for other nutrient sources. The minimum required setbacks for the natural stream and wetlands do not affect the spreadable area based on current crop production areas. The two closest drinking water sources, each from wells, were observed to be  $> 30$  m from the crop production area receiving nutrients. The location of these drinking water sources does not affect the spreadable area. The total area receiving nutrients is equal to the total cropland at 124.4 acres.

### FERTILIZER HANDLING & STORAGE

Two storage structures are utilized for fertilizer storage, one for each property:

At 23072 64th Street (West): The storage structure houses both fertilizer (liquid and granular) and pesticides, stored in separate rooms. The storage structure has a concrete floor and only stores the fertilizer needed for the current season's application.

At 23500 64th Street (East): The storage structure houses both liquid and granular fertilizer. The storage structure has a concrete floor and only stores the fertilizer needed for the current season's application.

Both locations load granular fertilizer over imperfectly drained silty clay loam outside near the storage sheds.

## **MANURE HANDLING & STORAGE**

All raspberry fields have received poultry manure (broiler-breeder) for the past two years. Poultry manure is delivered from a neighboring poultry operation at the time of application, and is immediately broadcasted in the field. No manure is stored on either property. Both locations load solid manure over imperfectly drained silty clay loam outside near the storage sheds.

## **NUTRIENT APPLICATION SUMMARY**

### **BLUEBERRY FIELDS**

Granular fertilizer applications begin in early April, approximately 2 weeks prior to early bloom. They are side banded along the blueberry hills using a pull behind fertilizer spreader.

Liquid applications begin once the irrigation system is operational, which usually occurs after the areas average last frost date (April 11 – April 20). All fields receive weekly nitrogen (liquid urea) applications through a fertilizer injector located on each farm site. These applications are used throughout the growing season between bloom and the end of harvest.

Supplemental foliar fertilizers are applied with a pull behind fan sprayer and are used to correct micronutrient deficiencies during the growing season, such as boron and zinc, and to apply foliar calcium for fruit development during the early stages of fruit development.

### **RASPBERRY**

The farm has access to free poultry manure, and has historically utilized this as the first nutrient source in raspberry fields, followed by fertigation. Poultry manure is banded along the rows using a narrow mulch spreader. Granular fertilizer applications are also applied in early April, and are side banded along the rows using a pull behind fertilizer spreader.

Liquid applications can begin once the irrigation system is operational, which usually occurs after the areas average last frost date (April 11 – April 20). All fields receive fertigation (urea) applications through a fertilizer injector located on each farm site. Regular applications throughout the growing season are ideal for applying liquid fertilizer.

## **CROP PRODUCTION & IRRIGATION SUMMARY**



## BLUEBERRY

### Duke (2012) – 17.9 acres

This field was planted in 2012 at 4 ft x 10 ft spacing (1110 plants/ac). The alleyways are maintained as bare soil with the use of herbicides and tilling throughout the growing season. New sawdust mulch was applied over winter 2023/2024. These plants are pruned annually, with organic material left in the alleyways and mulched using a flail mower. Irrigation is supplied through a single raised dripline, with 18 in emitter spacing.

Harvest for this variety begins the end of June to mid-July. This field has reached mature (9+ years) production capacity. Based on historical yield data, an average expected yield of approximately 5.4 ton/ac (10800 lb/ac) can be assumed in 2024.

### Reka (2017) – 24.6 acres

This field was planted in the fall of 2017 at 3 ft x 10 ft spacing (1480 plants/ac). A perennial grass cover crop is present between the rows, which is maintained throughout the growing season by mowing with a rear discharge flail mower. No sawdust has been applied in several years. Typically, these plants are pruned annually, however they were not pruned ahead of the 2024 growing season. Irrigation is supplied through a double raised dripline, with 18 in emitter spacing.

Harvest for this variety begins around the end of July to mid-August. This field is in its 7th year of production. Based on this field's historical performance, and continued growth, a yield of approximately 6.6 ton/ac (13200 lb/ac) is expected in 2024.

### Calypso (2021) – 39.0 acres

This field was planted in the fall of 2021 at 2.0 ft x 10 ft spacing (2220 plants/ac). A perennial grass cover crop is present between the rows, which is maintained throughout the growing season by mowing with a rear discharge flail mower. New sawdust mulch was applied over winter 2022/2023. These plants are pruned annually, with organic material left in the alleyways and mulched using a flail mower. Irrigation is supplied through a double raised dripline, with 18 in emitter spacing.

Harvest for this variety begins early August. This is the first year of expected crop from this variety, with no historical yield available. Based on this farm's capabilities, and the averages from other producers, this field expects a yield of approximately 1.8 ton/ac (3600 lb/ac) in 2024.

## RASPBERRY

### Meeker (2010) – 24.3 Acres

This field was established in 2010, with rows constructed at 10 ft spacing. This field has had poultry manure applied in early spring, in each of the last two years. Irrigation is supplied through a single dripline, with 18 in emitter spacing, along one side of the raspberry hill. Old fruited floricanes are pruned out annually during the winter, and then mulched and incorporated into the alleyways annually in the spring.

Based on this field's historical performance, it is expected that this field will yield approximately 3.25 ton/ac (6500 lb/ac) in 2024.

### Cascade Harvest (2020) – 18.6 Acres

This field was established in spring 2020, with rows constructed at 10 ft spacing. This field has had poultry manure applied in early spring, in each of the last two years. Irrigation is supplied through a single dripline, with 18 in emitter spacing, along one side of the raspberry hill. Old fruited floricanes are removed following harvest in late August, with the organic material removed from the field to be burned. A cover crop is then planted in the alleyways in early September.

This field is expected to reach maximum production capacity in 2025. Based on this farm's capabilities, and historical yield data, we can assume a yield of approximately 4.7 ton/ac (9500 lb/ac) in 2024.

## APPLICATION NOTES

There is a natural stream and wetlands south of the East property, with Cascade Harvest (2020) and Calypso (2021). A steep slope (>10%) is present within the preceding 150 m prior to the natural stream, putting this section in very high risk of runoff. The distance between the end of the crop rows to the natural stream is approximately 8 m at the most narrow point.

There is a channelized stream bisecting the West property, with both sections sloping towards the stream. The north portion is shown with a steep slope (>10%) in the preceding 150 m, placing this section as very high risk for surface runoff. The southern section of this property is observed with a very gentle slope; combined with poorly drained soil, this section of the field is placed as moderate risk to surface runoff.

No drain tiles are present in either property.

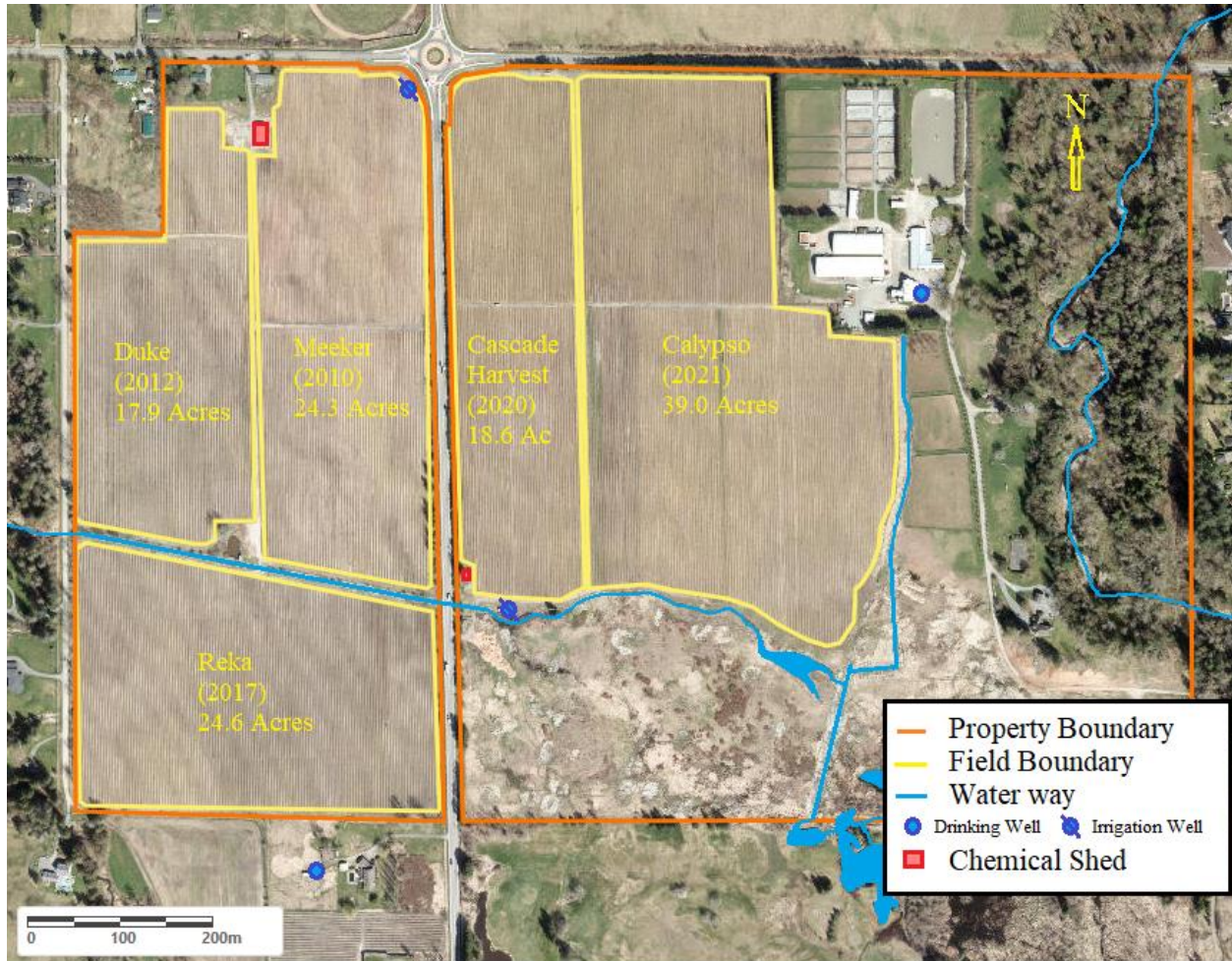
## SETBACKS

Minimum required setbacks from drinking water sources for commercial fertilizer and manure are 3.0 m and 30 m respectively. All observed drinking water wells are located > 30 m from any field, and will likely not affect setbacks.

Minimum required setbacks from natural streams for commercial fertilizer and manure are 1.5 m and 3.0 m respectively; however, the soil type and slope preceding the channelized and natural streams along the southern portion of the property place the Duke (2012), Meeker (2012), Cascade Harvest (2020), and Calypso (2021) fields at very high risk of nutrient runoff. Recommend a minimum of 10 m setback if applying nutrients in October, February, and March when runoff risk is greatest.

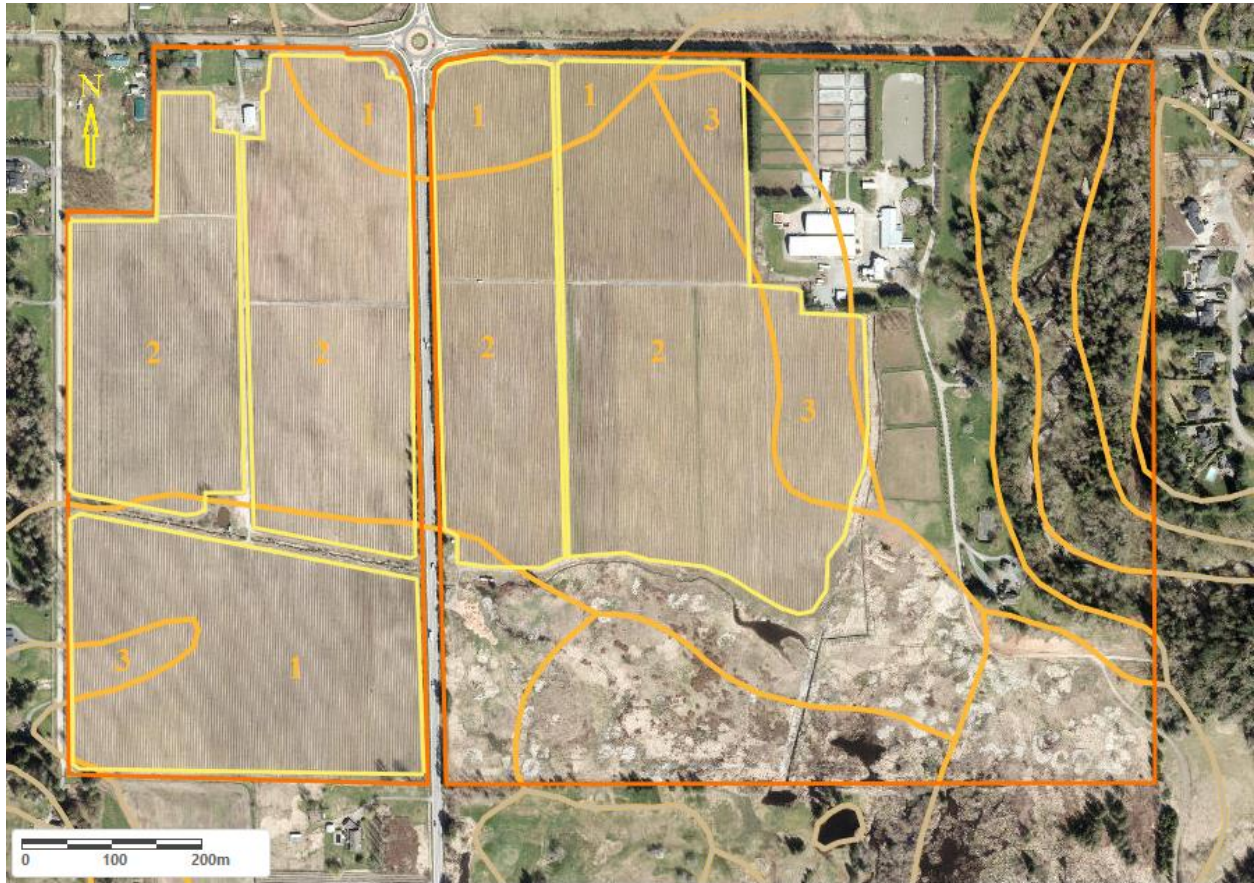
# FARM MAPS

## PROPERTY AND FIELD MAP



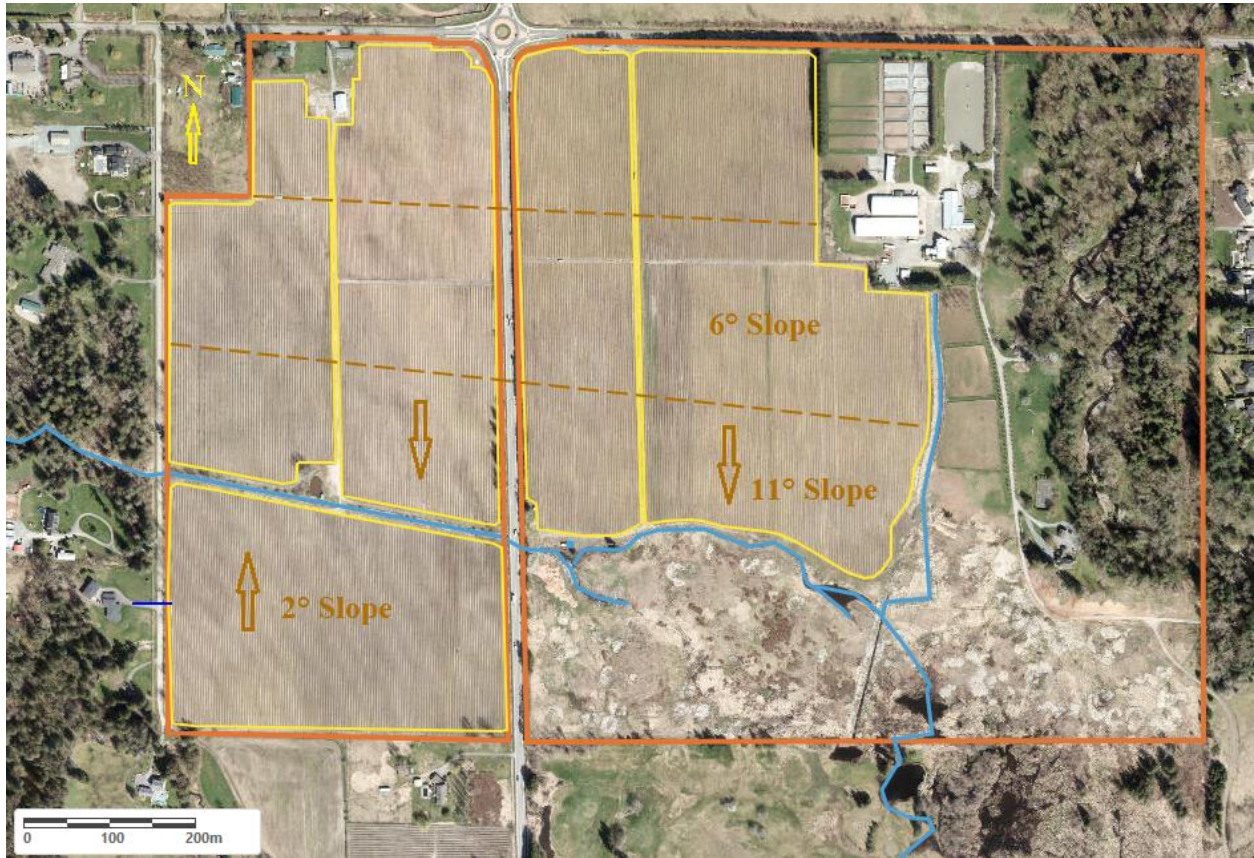
Field Name	Crop	Total Acreage	Spreadable Acreage
Duke (2012)	Blueberry	17.9	17.9
Reka (2017)	Blueberry	24.6	24.6
Calypso (2021)	Blueberry	39.0	39.0
Meeker (2010)	Raspberry	24.3	24.3
Cascade Harvest (2020)	Raspberry	18.6	18.6
		<b>124.4</b>	<b>124.4</b>

## SOIL CLASSIFICATION MAP



Soil ID:	Soil Name	Soil Classification	Soil Texture	Drainage Class
1	CLOVERDALE	Humic Luvic Gleysol	Silty Clay Loam	Poorly Drained
2	BERRY	Gleyed Podzolic Gray Luvisol	Silty Clay Loam	Imperfectly Drained
3	MURRAYVILLE	Gleyed Humo-Ferric Podzol	Loam	Imperfectly Drained

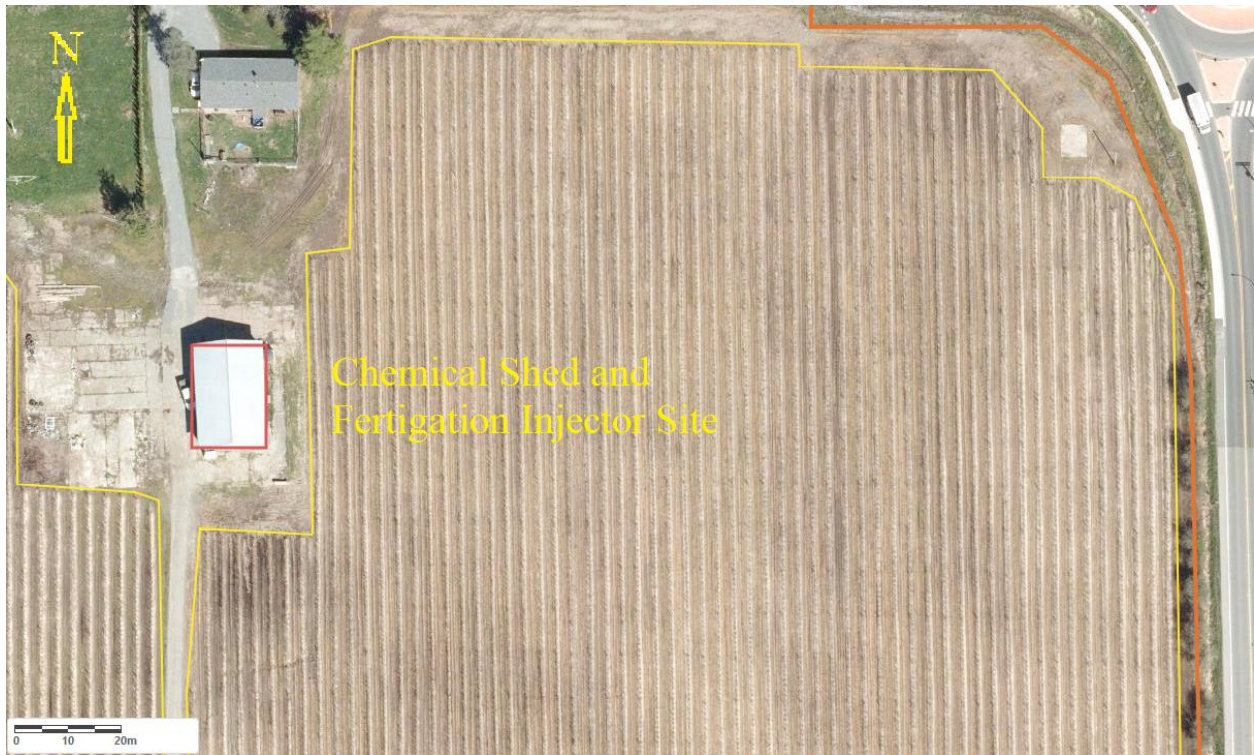
## SURFACE FEATURE MAP



## DRINKING WATER WELLS SETBACK MAPS



## FERTILIZER STORAGE MAPS



## NUTRIENT INVENTORY

All solid manure and fertilizer are imported to the farm for use as nutrients. No nutrient sources are expected to be produced or exported during the time period described in this nutrient management plan. The following tables outlines the total nutrient requirement, per product, for this farm enterprise over the 2024 growing season:

Material	Total Amount Required in 2024
Ammonium sulphate (21-0-0-24S)	2435.79 kg
Sulphate of potash (0-0-50-17S)	1927.77 kg
Liquid urea (23-0-0)	12,492.58 L
Urea (46-0-0)	1673.76 kg
18-9-9	1769.01 kg
Custom (Dry) 15-5-15	2204.46 kg

Material	Material Source	Annual Amount	Land-applied	Amount Remaining
Chicken-broiler breeder composted manure	Poultry manure	36 tons	36 tons (99%)	None

## FIELD SUMMARIES

### DUKE (2012) – 17.9 ACRES

Crop	Yield	Previous crop ploughed down (N credit)
Blueberry	5.4 ton/ac	none (no N credit)

Soil Test Results: August 2023		Soil test P & K Method: A & L Canada (Bray-1 and Mehlich 3)	
Nitrate-N: 31 ppm	Phosphorus: 133 ppm (High)	Potassium: 172 ppm (Med)	pH: 5.6
<b>Field Comments:</b> 4 ft x 10 ft Row Spacing – New Sawdust Mulch Applied – Winter Pruning Mulched Between Rows			

#### Nutrient Application Plan: 2024

Nutrient Source	Application Timing	Method	Rate
Ammonium sulphate (21-0-0-24S)	April 2024	Banded	300 lb/ac
Sulphate of potash (0-0-50-17S)	April 2024	Banded	100 lb/ac
Liquid urea (23-0-0)	May 2024	Fertigation	40 L/ac
Liquid urea (23-0-0)	June 2024	Fertigation	40 L/ac
Liquid urea (23-0-0)	July 2024	Fertigation	40 L/ac
Liquid urea (23-0-0)	August 2024	Fertigation	40 L/ac

	Agronomic Balance (lb/ac)			Crop Removal Balance (lb/ac)		
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Blueberry	-150	0	-50	-150	-7	-27
Ammonium sulphate (21-0-0-24S)	63	0	0	63	0	0
Sulphate of potash (0-0-50-17S)	0	0	50	0	0	50
Liquid urea (23-0-0)	23	0	0	23	0	0
Liquid urea (23-0-0)	23	0	0	23	0	0
Liquid urea (23-0-0)	23	0	0	23	0	0
Liquid urea (23-0-0)	23	0	0	23	0	0
<b>Balance</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>-7</b>	<b>23</b>

#### NOTES AND CONSIDERATIONS:

- In early April, prior to bloom, band ammonium sulphate and sulphate of potash. Both of these fertilizers are acidifying and will help lower the soil pH.
- The current soil pH was measured at 5.6, which is considered high for BC blueberry production, and should be between 4.5 – 5.2. Additional elemental sulphur can be added to help correct pH levels.
- In early May, begin to fertigate liquid urea at a rate of 10 – 12.5 L/ac per week, for a total of 40 – 50 L/ac per month, continuing until the end of harvest (approximately 12 – 14 weeks).
- 2023 post-harvest soil and tissue levels for nitrogen were high compared to other blueberry fields, suggesting last year's application were too high, and should be adjusted. However, new sawdust mulch will require approximately 25 lb/ac of nitrogen in the first year, so keep total applications consistent with the previous year.

#### 2023 Foliar Tissue Test Results – A&L Laboratories Canada

Field Name	Sampling Date	Crop	Nitrogen	Phosphorous	Potassium
Duke (2010)	August 15, 2023	Blueberry	2.45 % (High)	0.15 % (High)	0.28 % (Med)



## REKA (2017) – 24.6 ACRES

Crop	Yield	Previous crop ploughed down (N credit)
Blueberry	6.6 ton/ac	none (no N credit)

Soil Test Results: August 2023		Soil test P & K Method: A & L Canada (Bray-1 and Mehlich 3)	
Nitrate-N: 15 ppm	Phosphorus: 160 ppm (High)	Potassium: 182 ppm (Med)	pH: 5.1
<b>Field Comments:</b> 3 ft x 10 ft Row Spacing			

### Nutrient Application Plan: 2024

Nutrient Source	Application Timing	Method	Rate
Urea (46-0-0)	April 2024	Banded	150 lb/ac
Sulphate of potash (0-0-50-17S)	April 2024	Banded	100 lb/ac
Liquid urea (23-0-0)	May 2024	Fertigation	25 L/ac
Liquid urea (23-0-0)	June 2024	Fertigation	25 L/ac
Liquid urea (23-0-0)	July 2024	Fertigation	25 L/ac
Liquid urea (23-0-0)	August 2024	Fertigation	25 L/ac

	Agronomic Balance (lb/ac)			Crop Removal Balance (lb/ac)		
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Blueberry	-123	0	-50	-123	-8	-30
Urea (46-0-0)	69	0	0	69	0	0
Sulphate of potash (0-0-50-17S)	0	0	50	0	0	50
Liquid urea (23-0-0)	14	0	0	14	0	0
Liquid urea (23-0-0)	14	0	0	14	0	0
Liquid urea (23-0-0)	14	0	0	14	0	0
Liquid urea (23-0-0)	14	0	0	14	0	0
<b>Balance</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>-8</b>	<b>20</b>

### NOTES AND CONSIDERATIONS:

- In early April, prior to bloom, band urea and sulphate of potash.
- In early May, begin to fertigate liquid urea at a rate of 6 – 8 L/ac per week, for a total of 24 – 32 L/ac per month, continuing until the end of harvest (approximately 12 – 14 weeks).
- 2023 post-harvest soil and tissue levels for nitrogen were average. Keep nitrogen inputs consistent with previous season, allowing for a marginal increase due to plant age and expected increased yields.

### 2023 Foliar Tissue Test Results – A&L Laboratories Canada

Field Name	Sampling Date	Crop	Nitrogen	Phosphorous	Potassium
Reka 2017	August 15, 2023	Blueberry	1.85 % (Med)	0.22 % (High)	0.35 % (Med)

## CALYPSO (2021) – 39.0 ACRES

Crop	Yield	Previous crop ploughed down (N credit)
Blueberry	1.8 ton/ac	none (no N credit)

Soil Test Results: August 2023		Soil test P & K Method: A & L Canada (Bray-1 and Mehlich 3)	
Nitrate-N: 25 ppm	Phosphorus: 88 ppm (High)	Potassium: 143 ppm (Med)	pH: 4.8
<b>Field Comments:</b> 2 ft x 10 ft Row Spacing – Winter Pruning Mulched Between Rows			

### Nutrient Application Plan: 2024

Nutrient Source	Application Timing	Method	Rate
18-9-9	April 2024	Banded	100 lb/ac
Liquid urea (23-0-0)	May 2024	Fertigation	30 L/ac
Liquid urea (23-0-0)	June 2024	Fertigation	30 L/ac
Liquid urea (23-0-0)	July 2024	Fertigation	30 L/ac
Liquid urea (23-0-0)	August 2024	Fertigation	30 L/ac

	Agronomic Balance (lb/ac)			Crop Removal Balance (lb/ac)		
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Blueberry	-85	0	0	-85	-1	-6
18-9-9	18	9	9	18	9	9
Liquid urea (23-0-0)	17	0	0	17	0	0
Liquid urea (23-0-0)	17	0	0	17	0	0
Liquid urea (23-0-0)	17	0	0	17	0	0
Liquid urea (23-0-0)	17	0	0	17	0	0
<b>Balance</b>	<b>1</b>	<b>9</b>	<b>9</b>	<b>1</b>	<b>8</b>	<b>3</b>

### NOTES AND CONSIDERATIONS:

- In early April, prior to bloom, band a standard blueberry blended fertilizer to provide a full range of nutrients to the young field.
- In early May, begin to fertigate liquid urea at a rate of 7 – 9 L/ac per week, for a total of 28 – 36 L/ac per month, continuing until the end of harvest (approximately 12 – 14 weeks).
- 2023 post-harvest soil nitrogen was on the high side while foliar tissue samples were average. Poor nitrogen uptake due to small plant size and lack of roots is likely to contribute to the higher soil nitrogen level. Keep nitrogen inputs consistent with previous season, allowing for a marginal increase due to plant age and expected first year yields.

### 2023 Foliar Tissue Test Results – A&L Laboratories Canada

Field Name	Sampling Date	Crop	Nitrogen	Phosphorous	Potassium
Calypso 2021	August 15, 2023	Blueberry	1.56 % (Med)	0.15 % (Med)	0.41 % (Med)

## MEEKER (2010) – 24.3 ACRES

Crop	Yield	Previous crop ploughed down (N credit)
Raspberry	3.25 ton/ac	none (no N credit)

Soil Test Results: August 2023		Soil test P & K Method: A & L Canada (Bray-1 and Mehlich 3)	
Nitrate-N: 14 ppm	Phosphorus: 261 ppm (High)	Potassium: 282 ppm (High)	pH: 6.3
<b>Field Comments:</b> 10 ft Row Spacing – Winter Pruning Mulched Between Rows			

### Nutrient Application Plan: 2024

Nutrient Source	Application Timing	Method	Rate
Custom (Dry) 15-5-15	April 2024	Banded	200 lb/ac
Liquid urea (23-0-0)	May 2024	Fertigation	15 L/ac
Liquid urea (23-0-0)	June 2024	Fertigation	15 L/ac
Liquid urea (23-0-0)	July 2024	Fertigation	15 L/ac

	Agronomic Balance (lb/ac)			Crop Removal Balance (lb/ac)		
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Raspberry	-64	0	-30	-64	-4	-12
Previous year's manure application	12	0	0	0	0	0
Custom (Dry) 15-5-15	30	10	30	30	10	30
Liquid urea (23-0-0)	9	0	0	9	0	0
Liquid urea (23-0-0)	9	0	0	9	0	0
Liquid urea (23-0-0)	9	0	0	9	0	0
<b>Balance</b>	<b>5</b>	<b>10</b>	<b>0</b>	<b>-7</b>	<b>6</b>	<b>18</b>

### NOTES AND CONSIDERATIONS:

- In early April, band a low phosphorus caneberry fertilizer with slow-release nitrogen to provide a full range of nutrients for an extended time.
- In early May, begin to fertigate liquid urea at a rate of 3 – 4 L/ac per week, for a total of 12 – 16 L/ac per month, continuing until the end of harvest (approximately 12 weeks).
- Excess nitrogen after harvest, regardless of the source, is especially harmful as it may delay cane dormancy and increase the risk of winter injury.

### 2023 Foliar Tissue Test Results – A&L Laboratories Canada

Field Name	Sampling Date	Crop	Nitrogen	Phosphorous	Potassium
Meeker 2010	August 15, 2023	Raspberry	2.4 % (Med)	0.22 % (High)	2.7 % (High)

## CASCADE HARVEST (2020) – 18.6 ACRES

Crop	Yield	Previous crop ploughed down (N credit)
Raspberry	4.7 ton/ac	none (no N credit)

Soil Test Results: August 2023		Soil test P & K Method: A & L Canada (Bray-1 and Mehlich 3)	
Nitrate-N: 33 ppm	Phosphorus: 127 ppm (High)	Potassium: 271 ppm (Med)	pH: 6.8
<b>Field Comments:</b> 10 ft Row Spacing – Summer Post Harvest Pruning Removed From The Field – Barley Fall Cover Crop Planted			

### Nutrient Application Plan: 2024

Nutrient Source	Application Timing	Method	Rate
Chicken-broiler breeder	Spring 2024	Broadcast, not incorporated	4 yards <sup>2</sup> /ac
Liquid urea (23-0-0)	May 2024	Fertigation	25 L/ac
Liquid urea (23-0-0)	June 2024	Fertigation	25 L/ac
Liquid urea (23-0-0)	July 2024	Fertigation	25 L/ac

	Agronomic Balance (lb/ac)			Crop Removal Balance (lb/ac)		
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Raspberry	-88	0	-60	-88	-8	-29
Previous year's manure application	12	0	0	0	0	0
Chicken-broiler breeder composted manure	19	43	66	27	62	66
Liquid urea (23-0-0)	14	0	0	14	0	0
Liquid urea (23-0-0)	14	0	0	14	0	0
Liquid urea (23-0-0)	14	0	0	14	0	0
Cover crop credits (Barley)	10	0	0	0	0	0
<b>Balance</b>	<b>-5</b>	<b>43</b>	<b>6</b>	<b>-19</b>	<b>54</b>	<b>37</b>

### NOTES AND CONSIDERATIONS:

- Manure credits carried over from previous seasons poultry manure application.
- Nitrogen credits are expected from the barley cover crop that was incorporated into the alleyway, and will release nitrogen during decomposition
- Composted poultry manure can continue to be used. Starting after February 15 but no later than dictated by your food safety program, broadcast apply manure. Recommend that a cover crop be planted on fields where manure was applied.
- In early May, begin to fertigate liquid urea at a rate of 5 – 6 L/ac per week, for a total of 20 – 24 L/ac per month, continuing until the end of harvest (approximately 12 weeks).
- Excess nitrogen after harvest, regardless of the source, is especially harmful as it may delay cane dormancy and increase the risk of winter injury.
- The current soil pH was measured at 6.8, which is considered high for BC raspberry production, and should be between 5.8 – 6.5. Soil outside the normal pH range may limit certain nutrient uptake.
- Crop requirement for phosphorus is met; 43 lb/ac adds no benefit to the crop.

### 2023 Foliar Tissue Test Results – A&L Laboratories Canada

Field Name	Sampling Date	Crop	Nitrogen	Phosphorous	Potassium
Meeker 2010	August 15, 2023	Raspberry	2.4 % (Med)	0.22 % (High)	2.7 % (High)

## PLAN RECOMMENDATIONS

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### NUTRIENT APPLICATIONS

The previous application schedule includes suggested nutrient application rates by season and field. The following general strategies are recommended:

#### BLUEBERRY

- Avoid using fertilizers containing only nitrate forms of nitrogen (such as calcium nitrate) as they may cause injury, reduced growth or may potentially be lost to leaching.
- In general, fertilizer rates should increase as the planting ages (up to year 9+).
- When fresh sawdust is applied, add approximately 25 lb of nitrogen/ac to compensate for the immobilization of nitrogen.
- Foliar application is an inefficient method of applying nitrogen fertilizer to blueberry plants.
- Fertigation is much more efficient, particularly because smaller amounts are applied more frequently.
- Avoid late season nitrogen applications as they may encourage late summer growth and increase susceptibility to winter injury and bacterial blight.

#### RASPBERRY

- Nitrogen is supplied to the crop in various forms including cover crop residue, compost or manure, irrigation water, and fertilizer.
- In coarse soils, experience has shown that nitrogen fertilizers should normally be applied twice per year. Start nitrogen applications in April and apply at monthly intervals.
- A single application, usually in early April, will provide nitrogen over an extended period of time.
- Excess nitrogen after harvest, regardless of the source, is especially harmful as it may delay cane dormancy and increase the risk of winter injury.
- Foliar applications are most effective during the early spring. Apply in slow drying conditions for the best uptake. Do not apply during very hot weather as leaf burning may occur.
- Caneberries use the nitrate form of nitrogen more readily than the ammonium form. Urea (ammoniacal N) is rapidly converted to nitrate nitrogen in warm, moist soil with a pH above 6.0.
- Establishing and maintaining a cover crop between the raspberry rows will reduce the risk of surface runoff, and excess nitrogen leaching from manure applications.
- The use of manure as an early spring nutrient source is best used when soils require phosphorus and potassium applications, in addition to nitrogen.

### MANURE ESTIMATES

Book values were used to estimate poultry manure nutrient content. During manure applications, use containers to collect a sample to be sent for laboratory analysis. Having the manure nutrient analysis will allow for more accurate application recommendations when the plan is updated next year.

### YIELD RECORDS

During harvest of both raspberry and blueberry, maintain yield records specific to each field and variety. A combination of yield records, foliar test results, and post-harvest soil test results can be used to calculate the crop nutrient removal and increase the accuracy of updated versions of this nutrient management plan.

## SOIL SAMPLING

For established fields, take soil samples for post-harvest nitrogen after crop harvest, or between August 15 and October 1. Each field's soil should be sampled to a 30 cm depth at 15 cm intervals and analyzed for post-harvest nitrate. Data from post-harvest nitrate testing (PHNT) can be used to determine if nitrogen was over or under applied, and to monitor changes in pH, phosphorus, potassium, calcium and magnesium. Samples should be collected at the same time of year in order to compare results.

Basic spring fertility soil samples can also be used for raspberries as soil analysis is the most accurate guide to fertilizer requirements. For established blueberry plantings, soil analysis is not as useful as tissue analysis.

Soil post-harvest nitrate and soil phosphorus tests are required every 3 years for each field. Records of soil testing should be kept for at least 5 years. Due to high post-harvest nitrate levels in 2023, the following fields require PHNT soil samples in 2024:

- Duke (2012)
- Cascade Harvest (2020)

## FOLIAR TISSUE SAMPLING

Leaf analysis is the best method to determine nutrient needs in blueberries, and can be used to determine nutrient needs in raspberries. Take leaf samples from mid-July to mid-August to determine the fertilizer requirements for the following year. Leaf analysis may also be used earlier in the year or after harvest, if a nutrient deficiency is suspected. For the best interpretation, take leaf samples at the same stage of plant development (e.g., mid-harvest or late harvest) each year and monitor year to year trends in nutrient status.

## UPDATING THIS NUTRIENT MANAGEMENT PLAN

Following soil sampling in fall of 2024, and foliar tissue sampling in late July to August, this plan should be reviewed and updated to more accurately reflect soil nutrient levels, expected yields, and crop nutrient uptake.

## STRATEGIES TO MEET REGULATORY REQUIREMENTS

As this farm is in a high-precipitation area, fertilizer cannot be applied from November through January.

Before any nutrient applications in October, February, or March, an application risk assessment must be completed, preferably within 24 hours before application. BC Application Risk Management (ARM) tool can be used for this.

No nutrient applications should be made during high-risk conditions. This includes strong, divergent windy conditions, storm events, when the water table is high and close to the surface, or flooding.

## **RECORDKEEPING FOR NUTRIENT APPLICATION AND CROP YIELDS**

Nutrient application records including type, rate, time and location must be noted and kept on record for 5 years. In addition, crop yields for the fields where nutrient sources are applied must be kept on record for 5 years. The record keeping sheets found in your .nmp file can be used to record rates during nutrient application and crop yields during harvest.

## DISCLAIMER

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The author of this plan, Rick Amundsen, is not responsible for actions taken that deviate from this plan. Additionally, this plan should not be considered an exhaustive list of actions for nutrient management on this farm. The owner and operators of this farm are responsible for following all local, provincial, and federal rules relating to nutrient management.



# APPENDICES

## APPENDIX A: A&L CANADA LABORATORIES SOIL TEST RESULTS

SOIL TEST REPORT															
Sample Number	Depth	Lab Number	Organic Matter	Phosphorus Bray-P1 ppm	Potassium K ppm	Magnesium Mg ppm	Calcium Ca ppm	pH	CEC meq/100g	Percent Base Saturations					
								Buffer	% K	% Mg	% Ca	% H	% Na		
Duke 2012	15 cm	53711	4.4	133 VH	172 M	60 VL	520 VL	5.6	5.9	16.8	2.1	3.0	15.5	78.7	0.6
Reka 2017	15 cm	53712	4.2	160 VH	182 M	152 L	600 VL	5.1	5.8	19.4	3.5	6.5	15.5	74.1	0.4
Calypso 2021	15 cm	53713	4.7	88 H	143 M	82 VL	440 VL	4.8	5.9	16.4	1.8	4.2	13.4	80.3	0.3
Meeker 2010	15 cm	53714	6.8	261 VH	282 H	149 L	650 VL	6.3	6.5	17.0	2.6	7.3	19.1	70.5	0.5
Cascade Harvest 2020	15 cm	53715	4.4	127 VH	271 H	87 VL	430 VL	6.8	6.5	17.7	3.2	2.4	12.5	80.7	1.2

Sample Number	Sulphur S ppm	Nitrate Nitrogen NO <sub>3</sub> ppm	Zinc Zn ppm	Manganese Mn ppm	Iron Fe ppm	Copper Cu ppm	Boron B ppm	Saturation % P	Aluminum % Al	K/Mg AL ppm	ENR Ratio	Sodium Na ppm	
Duke 2012	40 VH	31 H	3.3 M	7 L	90 VH	3.5 VH	1.1 M	3 L	16.3 ST	1871	0.70	81	25 L
Reka 2017	23 VH	15 M	3.4 M	11 L	119 VH	3.0 H	0.3 VL	10 H	16.1 ST	1338	0.54	54	18 L
Calypso 2021	16 H	25 M	2.7 L	3 VL	92 VH	2.8 H	0.2 VL	6 M	7.7 ST	1373	0.43	60	13 VL
Meeker 2010	19 H	14 M	3.4 M	10 L	123 VH	3.4 VH	0.2 VL	6 M	6.3 ST	1356	0.36	58	18 L
Cascade Harvest 2020	44 VH	33 H	3.1 M	4L	82 VH	2.9 VH	0.1 VL	7 M	8.4 ST	1418	0.31	74	22 L

## APPENDIX B: A&L CANADA LABORATORIES FOLIAR TEST RESULTS

PLANT ANALYSIS REPORT															
Sample Number	Date Sampled	Lab Number	Nitrogen %	Sulphur %	Phosphorus %	Potassium %	Magnesium %	Calcium %	Sodium %	Boron ppm	Zinc ppm	Manganese ppm	Iron ppm	Copper ppm	Aluminum ppm
Duke 2012	2023-08-15	53711	2.45	0.09	0.15	0.28	0.15	0.42	0.01	8.13	16	92	60	6.03	70
Reka 2017	2023-08-15	53712	1.85	0.09	0.22	0.35	0.15	0.46	0.01	13.45	12	109	57	4.44	59
Calypso 2021	2023-08-15	53713	1.56	0.09	0.15	0.41	0.14	0.44	0.01	11.04	9	53	48	3.44	58
Meeker 2010	2023-08-15	53714	2.4	0.15	0.22	2.7	0.21	0.43	0.01	9.29	10	82	53	4.78	61
Cascade Harvest 2020	2023-08-15	53715	2.40	0.09	0.22	2.70	0.18	0.50	0.01	5.77	9	109	53	4.32	41

## APPENDIX C: MANURE ANALYSIS

All results are provided on an as-received (wet weight) basis

Source of Material	Material Type	Moisture (%)	Total N (%)	NH <sub>4</sub> N (ppm)	P (%)	K (%)
Poultry manure	Chicken-broiler breeder composed manure	46	1.25	3096	0.84	1.71

## APPENDIX D: HISTORICAL YIELD RECORDS

Grower Provided Total Historical Yield (lb)					
Year	Duke (2012)	Reka (2017)	Calypso (2021)	Meeker (2010)	Cascade Harvest (2020)
2018	204,225	-	-	199,260	-
2019	231,984	-	-	152,483	-
2020	216,948	110,208	-	168,885	-
2021	159,668	150,847	-	100,237	-
2022	197,616	228,288	-	151,875	78,120
2023	176,136	272,568	-	195,008	124,620

Grower Provided Total Historical Yield (lb/ac)					
Year	Duke (2012)	Reka (2017)	Calypso (2021)	Meeker (2010)	Cascade Harvest (2020)
2018	10,996	-	-	8,200	-
2019	12,960	-	-	6,272	-
2020	12,120	4,480	-	6,950	-
2021	8,920	6,132	-	4,125	-
2022	11,040	9,280	-	6,250	4,200
2023	9,840	11,080	-	8,025	6,700

## APPENDIX E: SOIL DRAINAGE CLASSES

Code	Class	Description
VR	Very rapidly drained	Water is removed from the soil very rapidly in relation to supply. Excess water flows downward very rapidly if underlying material is pervious. There may be very rapid subsurface flow during heavy rainfall provided there is a steep gradient. Soils have very low available water storage capacity (usually less than 2.5 cm) within the control section and are usually coarse textured, or shallow, or both. Water source is precipitation.
R	Rapidly drained	Water is removed from the soil rapidly in relation to supply. Excess water flows downward if underlying material is pervious. Subsurface flow may occur on steep gradients during heavy rainfall. Soils have low available water storage capacity (2.5-4 cm) within the control section, and are usually coarse textured, or shallow, or both. Water source is precipitation.
W	Well drained	Water is removed from the soil readily but not rapidly. Excess water flows downward readily into underlying pervious material or laterally as subsurface flow. Soils have intermediate available water storage capacity (4-5 cm) within the control section, and are generally intermediate in texture and depth. Water source is precipitation. On slopes subsurface flow may occur for short durations, but additions are equaled by losses.
MW	Moderately well drained	Water is removed from the soil somewhat slowly in relation to supply. Excess water is removed somewhat slowly due to low perviousness, shallow water table, lack of gradient, or some combination of these. Soils have intermediate to high water storage capacity (5-6 cm) within the control section and are usually medium to fine textured. Precipitation is the dominant water source in medium to fine textured soils; precipitation and significant additions by subsurface flow are necessary in coarse textured soils.
I	Imperfectly drained	Water is removed from the soil sufficiently slowly in relation to supply, to keep the soil wet for a significant part of the growing season. Excess water moves slowly downward if precipitation is the major supply. If subsurface water or groundwater, or both, is the main source, the flow rate may vary but the soil remains wet for a significant part of the growing season. Precipitation is the main source if available water storage capacity is high; contribution by subsurface flow or groundwater flow, or both, increases as available water storage capacity decreases. Soils have a wide range in available water supply, texture, and depth, and are gleyed phases of well drained subgroups.
P	Poorly drained	Water is removed so slowly in relation to supply that the soil remains wet for a comparatively large part of the time the soil is not frozen. Excess water is evident in the soil for a large part of the time. Subsurface flow or groundwater flow, or both, in addition to precipitation are the main water sources; there may also be a perched water table, with precipitation exceeding evapotranspiration. Soils have a wide range in available water storage capacity, texture, and depth, and are gleyed subgroups, Gleysols, and Organic soils.
VP	Very poorly drained	Water is removed from the soil so slowly that the water table remains at or on the surface for the greater part of the time the soil is not frozen. Excess water is present in the soil for the greater part of the time. Groundwater flow and subsurface flow are the major water sources. Precipitation is less important except where there is a perched water table with precipitation exceeding evapotranspiration. Soils have a wide range in available water storage capacity, texture, and depth, and are either Gleysolic or Organic.



March 2021

# Spill Reporting

**Report spills immediately**

If a spill occurs, or is at imminent risk of occurring, responsible persons (spillers) must ensure that it is immediately reported to the Provincial Emergency Program (PEP)/ Emergency Management British Columbia (EMBC) by calling **1-800-663-3456**.

Section 91.2 of *Environmental Management Act* (EMA) identifies the requirements for spill reporting. The [Spill Reporting Regulation](#) (SRR) prescribes the information that is required, as well as the time and manner in which it is required, when reporting spills.

This Fact Sheet is designed to provide information for responsible persons on their reporting obligations should they be in possession, charge, or control of a substance when it spills or is at imminent risk of spilling.

The SRR identifies three reports that responsible persons must make based on specific criteria: Initial Report; Update to Minister Report; and End-of-Spill Report. Responsible persons may also be required to make a fourth report, a Lessons-Learned Report, if ordered to do so by a director. The purpose of these reports is to ensure that the Ministry of Environment and Climate Change Strategy (the ministry) has the appropriate information necessary to assess spill impacts and fulfil oversight and regulatory roles and responsibilities.

**Responsible Person**

A responsible person has possession, charge or control of a substance or thing when a spill of the substance or thing occurs or is at imminent risk of occurring.

**Definition of a Spill**

A spill is defined by the *Environmental Management Act* as the introduction into the environment, other than as authorized and whether intentional or unintentional, of a substance or thing that has the potential to cause adverse effects to the environment, human health, or infrastructure.

## Initial Report

Section 4 of the SRR outlines the information required in the Initial Report. An Initial Report must be made immediately if any of the following occur or is at imminent risk of occurring:

1. **If the volume spilled, or likely to be spilled, is equal to or greater than the minimum quantity outlined in the SRR, the spill is reportable.** A list of substances and their reportable quantities is available in Appendix 2: Prescribed substances and quantities for immediate spill reporting of this Fact Sheet.
2. **If the spill enters, or is likely to enter, a body of water, the spill is reportable.** A body of water is defined in the SRR and includes both marine and fresh bodies of water whether or not they usually



contain water or ice, as well as streams, lakes, ponds, rivers, creeks, springs, aquifers, ravines, gulches, wetlands, and glaciers. The requirement to report a spill of a listed substance of any quantity also includes spills that enter a ditch that is not self-contained and connects to a body of water.

The Initial Report must be made immediately to EMBC by calling 1-800-663-3456. Anyone can make the Initial Report; however, the responsible person must ensure the report has been made and all the information outlined in section 4 of the SRR has been reported. (Appendix 1)

<b>Natural Gas</b>
A release of natural gas is reportable if: <ol style="list-style-type: none"><li>1. The spill is caused by a breakage in a pipeline or fitting operated above 100 pounds per square inch (psi) that results in a sudden release of natural gas; and</li><li>2. The amount of the spill is, or is likely to be, equal to or greater than 10 kilograms (kg).</li></ol>

### Update to Minister Report

Section 5 of the SRR outlines the requirement for the submission of Update to Minister Reports. Responsible persons must provide an Update to Minister Report:

1. **As soon as possible on request of the minister.**
2. **At least once every 30 days after the date that the spill began** until such time that an End-of-Spill Report is required.
3. **At any time that the responsible person has reason to believe that information that was previously reported as part of the Initial Report, as outlined in Appendix 1, was or has become inaccurate or incomplete.**

If the Update to Minister Report is requested by the Minister or if the spill lasts more than 30 days and the Update to Minister Report is required, an email will be sent by the ministry to the responsible person with instructions on how to complete the report form and how it must be submitted.

If the responsible person believes information previously reported as part of the Initial Report was or has become inaccurate or incomplete, the responsible person can contact the Environmental Emergency Program at [SpillReports@gov.bc.ca](mailto:SpillReports@gov.bc.ca), stating the Dangerous Goods Incident Report number in the subject line, to advise that an Update to Minister Report is required. Instructions on how to complete the report form and how it must be submitted will be sent to the responsible person by email.

### End-of-Spill Report

Section 6 of the SRR outlines the requirement for the submission of End-of-Spill Reports. Responsible persons must submit a written report to the ministry within 30 days following the emergency response completion date of a spill, see information box below. An End-of-Spill Report is required when:

1. **The volume spilled is equal to or greater than the minimum quantity outlined in the SRR.** A list of substances and quantities for immediate spill reporting (is provided in Appendix 2.);
2. **The spill enters, or is likely to enter, a body of water-** 'body of water' is defined in the SRR.

The accountability to adhere to the requirements set out in the SRR is that of the responsible person. All reports, other than the Initial Report, are to be sent to the Environmental Emergency Program at [SpillReports@gov.bc.ca](mailto:SpillReports@gov.bc.ca).

### Emergency Response Completion Date

The emergency response completion date is defined in section 8 of the SRR as the date that all the following criteria are met:

1. The Incident Command Post is disestablished.
2. The source of the spill is under control and is neither spilling nor at imminent risk of spilling.
3. Emergency actions to stabilize, contain, and remove the spill have been taken.
4. The waste has been removed from the spill site.
5. All evacuation notices have expired or been rescinded.
6. All equipment, personnel, and other resources used in emergency spill response actions have been removed from the spill site, other than resources required for sampling, testing, monitoring, assessing the spill site, or for recovery and restoration of the spill site.

### Lessons-Learned Report

Section 7 of the SRR outlines the requirements of a Lessons-Learned Report. Within six months following the emergency response completion date of a spill, the director may order a Lessons-Learned Report from the responsible person. This report must be submitted to the director in the manner and form specified by the director. For additional information on the Lessons-Learned Report, please see the Lessons-Learned Fact Sheet.

### B.C. Oil and Gas Commission Equivalency

Responsible persons regulated by the B.C. Oil and Gas Commission (the Commission) under the [Emergency Management Regulation](#) must provide an Initial Report to EMBC, but are exempt from the following requirements in the SRR:

- Section 5 Update to Minister Report;
- Section 6 End-of-Spill Report; and
- Section 7 Lessons-Learned Report.

### Fines and Penalties

It is the responsibility of regulated persons, responsible persons and the owners of substances or things to understand and comply with EMA and its associated regulations.

This document is solely for the convenience of the reader and is intended to assist in understanding the legislation and regulations, not replace them. It does not contain and should not be construed as legal advice. Current legislation and regulations should be consulted for complete information.

Failure to be in compliance can result in convictions of fines and imprisonment, as outlined in *EMA* and its associated regulations.

### Additional Fact Sheets

Fact sheets on other relevant topics are published by the Environmental Emergency Program (EEP) and available at:

[www.gov.bc.ca/spillresponse](http://www.gov.bc.ca/spillresponse)

The complete list of available Fact Sheets:

- 01 Regulated Person
- 02 Responsible Person
- 03 Spill Reporting
- 04 Lessons-Learned Report
- 05 Cost Recovery
- 06 Requirement to Provide Information
- 07 Spill Contingency Planning
- 08 Testing Spill Contingency Plans
- 09 Recovery Plan

For more information, contact the  
Environmental Emergency Program  
at: [SpillReports@gov.bc.ca](mailto:SpillReports@gov.bc.ca)



## Appendix 1: Initial Report content

Report information	Description
1. Contact information of the individual making the report	First and last name, phone number, and email address
2. Contact information of the responsible person	First and last name, phone number, and email address
3. Contact information for the owner of the substance spilled	First and last name, phone number, and email address
4. Location, date, and time of the spill	Provide as much location specific information as possible, including: general directions, description of how to approach the area, latitude and longitude if available, street address, and the date and time in 24-hour clock format
5. Description of the spill site and surrounding area	Provide a description of the receiving environment of the spilled material (for example, the area is wooded and the ground is soft; there are sensitive riparian areas that are at risk of contamination)
6. A description of the source of the spill	The container from which the material spilled (for example, fishing vessel, above- or below-ground storage tank, tanker truck, pipeline, or railcar)
7. Type and quantity of the substance spilled	An estimate of the amount of product spilled and a description of the product type, including product name, UN number, and Safety Data Sheet [SDS] (for example, diesel, UN 1202, 50 liters). If unknown, a description of the spill (for example, sheen or slick approximately 20 meters by 20 meters)
8. Cause and impact of the spill	The circumstances leading to the spill; the immediate cause as well as any contributing factors. May be a combination of the activity and the incident (for example, motor vehicle accident, derailment, equipment failure, fire, human error, intentional/unauthorized release, natural occurrence, or unknown)
9. Details of the actions taken or proposed	Provide any necessary/ helpful details of the actions taken or planned (for example, what steps have been taken to contain the spill, which responders have been deployed, and when they will be on scene)
10. The details of further action contemplated or required	Provide any necessary/ helpful details regarding next steps, including response actions, deployment of additional resources, and monitoring activities
11. The names of agencies on scene	Any persons, government, federal government, local government, or Indigenous agencies
12. The names of other persons or agencies advised concerning the spill	Any persons, government, federal government, local government, or Indigenous agencies

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**Appendix 2: Prescribed substances and quantities for immediate spill reporting<sup>1</sup>**

Item	Column 1 Substance Spilled	Column 2 Specified Amount
1	Class 1, Explosives as defined in <a href="#">section 2.9 of the Federal Regulations<sup>2</sup></a>	50 kg, or less if the substance poses a danger to public safety
2	Class 2.1, Flammable Gases, other than natural gas, as defined in <a href="#">section 2.14 (a) of the Federal Regulations</a>	10 kg
3	Class 2.2 Non-Flammable and Non-Toxic Gases as defined in <a href="#">section 2.14 (b) of the Federal Regulations</a>	10 kg
4	Class 2.3, Toxic Gases as defined in <a href="#">section 2.14 (c) of the Federal Regulations</a>	5 kg
5	Class 3, Flammable Liquids as defined in <a href="#">section 2.18 of the Federal Regulations</a>	100 L
6	Class 4, Flammable Solids as defined in <a href="#">section 2.20 of the Federal Regulations</a>	25 kg
7	Class 5.1, Oxidizing Substances as defined in <a href="#">section 2.24 (a) of the Federal Regulations</a>	50 kg or 50 L
8	Class 5.2, Organic Peroxides as defined in <a href="#">section 2.24 (b) of the Federal Regulations</a>	1 kg or 1 L
9	Class 6.1, Toxic Substances as defined in <a href="#">section 2.27 (a) of the Federal Regulations</a>	5 kg or 5 L
10	Class 6.2, Infectious Substances as defined in <a href="#">section 2.27 (b) of the Federal Regulations</a>	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
11	Class 7, Radioactive Materials as defined in <a href="#">section 2.37 of the Federal Regulations</a>	Any quantity that could pose a danger to public safety and an emission level greater than the emission level established in section 20 of the Packaging and Transport of Nuclear Substances Regulations, 2015 (Canada)
12	Class 8, Corrosives as defined in <a href="#">section 2.40 of the Federal Regulations</a>	5 kg or 5 L
13	Class 9, Miscellaneous Products, Substances or Organisms as defined in <a href="#">section 2.43 of the Federal Regulations</a>	25 kg or 25 L

<sup>1</sup> If the spill enters, or is likely to enter, a body of water, it is reportable regardless of the quantity  
<sup>2</sup> Federal regulations refer to the Transportation of Dangerous Goods Regulations under the *Transportation of Dangerous Goods Act 1992*  
<sup>3</sup> Hazardous Waste Regulation refers to B.C. Reg. 63/88

14	Waste containing dioxin as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
15	Leachable toxic waste as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	25 kg or 25 L
16	Waste containing polycyclic aromatic hydrocarbons as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	5 kg or 5 L
17	Waste asbestos as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	50 kg
18	Waste oil as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	100 L
19	Waste that contains a pest control product as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	5 kg or 5 L
20	PCB wastes as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	25 kg or 25 L
21	Waste containing tetrachloroethylene as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	50 kg or 50 L
22	Biomedical waste as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
23	A hazardous waste as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a> and not covered under items 1 – 22	25 kg or 25 L
24	A substance, not covered by items 1 to 23, that can cause pollution	200 kg or 200 L
25	Natural gas	10 kg, if there is a breakage in a pipeline or fitting operated above 100 psi that results in a sudden and uncontrolled release of natural gas

## APPENDIX G: RECORD KEEPING SHEETS

Field: Duke (2012)		Area: 17.9 acres	Crop: Blueberry	Actual Yield:
2024 Plan			2024 Records	
Nutrient Source	Application Timing	Rate	Notes or modifications to plan	
Ammonium sulphate (21-0-0-24S)	April 2024	300 lb/ac		
Sulphate of potash (0-0-50-17S)	April 2024	100 lb/ac		
Liquid urea (23-0-0)	May 2024	40 L/ac		
Liquid urea (23-0-0)	June 2024	40 L/ac		
Liquid urea (23-0-0)	July 2024	40 L/ac		
Liquid urea (23-0-0)	August 2024	40 L/ac		

Field: Reka (2017)		Area: 24.6 acres	Crop: Blueberry	Actual Yield:
2024 Plan			2024 Records	
Nutrient Source	Application Timing	Rate	Notes or modifications to plan	
Urea (46-0-0)	April 2024	150 lb/ac		
Sulphate of potash (0-0-50-17S)	April 2024	100 lb/ac		
Liquid urea (23-0-0)	May 2024	25 L/ac		
Liquid urea (23-0-0)	June 2024	25 L/ac		
Liquid urea (23-0-0)	July 2024	25 L/ac		
Liquid urea (23-0-0)	August 2024	25 L/ac		

Field: Calypso (2021)		Area: 39.0 acres	Crop: Blueberry	Actual Yield:
2024 Plan			2024 Records	
Nutrient Source	Application Timing	Rate	Notes or modifications to plan	
18-9-9	April 2024	100 lb/ac		
Liquid urea (23-0-0)	May 2024	30 L/ac		
Liquid urea (23-0-0)	June 2024	30 L/ac		
Liquid urea (23-0-0)	July 2024	30 L/ac		
Liquid urea (23-0-0)	August 2024	30 L/ac		

Field: Meeker (2010)		Area: 24.3 acres	Crop: Raspberry	Actual Yield:
<b>2024 Plan</b>			<b>2024 Records</b>	
<b>Nutrient Source</b>	<b>Application Timing</b>	<b>Rate</b>	<b>Notes or modifications to plan</b>	
Custom (Dry) 15-5-15	April 2024	200 lb/ac		
Liquid urea (23-0-0)	May 2024	15 L/ac		
Liquid urea (23-0-0)	June 2024	15 L/ac		
Liquid urea (23-0-0)	July 2024	15 L/ac		

Field: Cascade Harvest (2020)		Area: 18.6 acres	Crop: Raspberry	Actual Yield:
<b>2024 Plan</b>			<b>2024 Records</b>	
<b>Nutrient Source</b>	<b>Application Timing</b>	<b>Rate</b>	<b>Notes or modifications to plan</b>	
Chicken-broiler breeder	Spring 2024	4 yards <sup>2</sup> /ac		
Liquid urea (23-0-0)	May 2024	25 L/ac		
Liquid urea (23-0-0)	June 2024	25 L/ac		
Liquid urea (23-0-0)	July 2024	25 L/ac		