Blueberries NZ (Inc.) comprises both growers and exporters of blueberries:

|  |  |
| --- | --- |
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Blueberries NZ (Inc.) has appointed a Secretary, Quality Manager and Research and Development Providers

**Secretary** Jan Bishell

Ph (07) 8566809 - 027 5556809

 Email janbishell@gmail.com

**Quality Manager**

**Research Providers**

Geoff Langford

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Quality Management is important, and this manual outlines the particular standards and methods that this Industry require. These standards and methods have been set by the Industry and it is the responsibility of all those people involved in the Blueberry Export Industry to promote and adhere to them and seek improvements, through discussion with BBNZ members.

***This Manual is divided into the following sections***

**Section A** - covers general grower/packer responsibilities and information relating to growing harvesting and handling of blueberries.

**Section B** - covers grower/packer responsibilities for export of fresh blueberries.

**Section C** - covers grower/packer responsibilities for export frozen blueberries, and includes temperature log for cold stores handling frozen blueberries.

***All Growers and Packers should be familiar with these sections - A + B + C***

**Section D** -outlines exporter roles and responsibilities and what the exporter assessor duties are.

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## FOOD SAFETY

Food safety is about making sure that food products are safe to eat. Put simply, it means taking care with all aspects of food production and preparation to make sure that what people eat does not make them ill. A preventative approach to food safety ensures you examine every stage of the process, identify the essential processes and make sure process remains consistent. The way to do this is to establish and maintain a food safety programme.

A food safety progamme is a set procedure for always producing safe food. It involves a thorough examination of a process in order to identify and control the hazard that could make food you produce harmful to eat. Put simply it asks “What might go wrong, and how do I make sure it doesn’t?”

The food industry is growing rapidly and so too are customer expectations. By staying ahead of customer expectations in relation to food safety you can improve your business potential and minimise the risks associated with food safety issues. Development of a food safety programme ensures that you are aware of potential hazards and enables you to control and limit these hazards. In the long run, hazards that are identified and controlled at the source save you time, money and worry.

It is recommended that all growers selling blueberries to the public have a recognised food and health safety programme in place. This programme must be kept up to date and audited.

## QUALITY ASSURANCE

**What Is Quality Assurance?**

Quality assurance includes the managing and monitoring of all activities which directly affect quality and which may occur at any stage in the growing, production and marketing chain.

Such activities might include:

Writing of specifications for

* fruit
* packaging
* processing
* storage

Keeping of records for inspection of spray diaries etc

Segregation of export from non-export product

**Quality Assurance Is Preventative in Nature**

This means that systems for monitoring the control of the process ensure that the product will meet the customers' requirements.

The cost of implementing quality assurance systems is low when compared with the cost of inspection of product at the completion of a line and/or rejection.

**QUALITY ASSURANCE IS EVERYBODY'S BUSINESS!**

## QUALITY CONTROL

Quality Control is the sub-group of Quality Assurance activities that are directly involved in the monitoring, recording and controlling of ongoing product manufacturing, to ensure the required level of quality is attained.

There is often a great deal of confusion between the terms Quality Assurance and Quality Control. Quality Control should be visualized as a subset of the whole Quality Assurance system. In effect, Quality Control is a planned program of systems and procedures, which monitor and control from start to finish.

**The Need for a Quality Controller**

Decisions as to whether a grower's quality system is satisfactory have traditionally been based on inspection of the final product. As one hundred percent inspection is often impossible, we now rely on inspection of a sample as an indication of the total product quality.

The Quality Controller's role is to random sample at the packing area. These samples should ensure that the level of defects does not exceed acceptable tolerances as specified in the fresh blueberry Quality Controller’s record sheet.

Quality Control checks throughout the production cycle are an integral part of Quality Assurance.

## GROWER ROLES AND RESPONSIBILITIES FOR FRESH AND FROZEN PRODUCT

The grower's responsibility is to produce a quality product, which meets market requirements. This is essential if the Industry is to maintain and expand export markets.

Export growers must comply with the following conditions

Register with Blueberries NZ (Inc.) by 01 November

Constantly comply with the Industry's export quality specifications

Observe withholding periods and not use any pesticides other than those recommended on the prescribed spray program. Pesticides used must not exceed the recommended rates.

Keep accurate spray diaries

Employ the best methods of husbandry in growing and care of the blueberry crop.

## BLUEBERRY SPRAYING REQUIREMENTS

This section applies to all growers including **Organic** and **Spray free**. This is essential to maintain the integrity of the Blueberries New Zealand residue testing program. All orchards will be residue tested and shown to be below each countries Multi Residue Level (MRL).

### Growsafe

All growers must attend and complete a minimum of a Growsafe introductory course. The number of your certificate will be required to complete your spray diary. Contact www.growsafe.co.nz or Ph: 0508 476 972 or email info@tbt.co.nz

### Spray Diary

The need for a spray diary to be completed is to assist you with monitoring when and what you or your employee applied to your crop.

The spray diary is used to assist Blueberries NZ (Inc) to ensure your crop meets the pesticide residue levels set down by the government of the country which imports and ultimately consumes your product. This is verified by conducting a residue test.

Failure to meet the importing country's requirements, with too high a residue level or a pesticide residue unacceptable to that country, may result in restricted market access, the destruction of the imported crop, major financial claims and the need for intensive pre-harvest residue testing in the future.

**Your spray diary should be:**

* honestly and accurately completed;
* clearly written;
* submitted electronically to Belinda Lategan- Asure Quality Ltd, 2 weeks before export;
* Completed for each block if a different spray program is used on each block. Hot house spray diaries should be submitted separately and will be tested separately.

If you have a particular pest or disease problem, contact your local Consultant.

Observe the withholding period (the amount of time that must elapse between the last application of the pesticide and harvesting of the crop). Failure to observe the correct time period may result in residues unacceptable to your markets.

Beware of spray drift from adjoining blocks, farms and different crops

within orchards which may cause problems.

### Pesticide Residue Procedures for Fresh Blueberries

All growers fruit is required to be residue tested prior to harvest. Where field blocks and hot houses are managed differently, separate spray diaries and residue tests must be completed.

An additional random sample will be collected for residue testing from all growers during the season.

**The Procedures are as follows:**

Growers must email their spray diary to Belinda Lategan – Asure Quality Ltd, 2 weeks prior to commencement of picking for export. Spray diaries are requested 2 weeks prior to harvest to allow time for spray diary details to be checked, samples to be collected and submitted to Hills Laboratories, Hamilton East Ph 07 857 0607 email chris.berkers@hills-labs.co.nz

Address to send spray diary: belinda.lategan@asurequality.com

When the diary is submitted, please indicate what pesticides you will be using during harvest.

 **If you do not send your diary in, you will NOT BE CLEARED for export**.

Once your berry sample has been tested you will be sent results detailing any residues that were found. This should be checked against the spray list to see which markets your product is suitable for. The results must be supplied to your exporter prior to your first consignment being shipped.

If residues above MRL’s are found further testing to gain clearance will be required at growers expense.

Additional random samples will be collected from each grower during the season – exporters will be notified when these samples are collected.

**A.6 BLUEBERRY Pest and Disease Control**

For specific detail on the latest recommendations for pest and disease management, consult the Pest and Disease Manual.

***blueberries New Zealand Inc***

**BLUEBERRY PEST AND DISEASE CONTROL**

**Spray usage**

Blueberries have a consistent history in New Zealand of having few pest and disease issues. This applies especially to newly planted areas that are likely to be largely free of serious pest and disease issues for several years. Specific programmes may often be required for particular pests and diseases that are causing problems on some varieties or on some blocks. It is important to target those areas that have been identified following regular monitoring. Data from the previous season is also important in deciding what treatments are appropriate. For further information refer to the Blueberry Pest and Disease manual.

The following programme is designed to assist with control of these specific issues. Growers should mix and match treatments according to the targeted pest and disease issues and application should focus on the problem areas

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Stage Disease/Pest Chemical options Alternatives**

 (All rates per 100 litres or as specified on the label)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Bud movement Leaf spots, anthracnose, Chlorothalonil

 Bacterial blast, rust copper spray

 Scale #chlorpyrifos and oil

 Phytophthora #phosphorous acid

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Over flowering Anthracnose, botrytis Switch (Note 3) captan wp 125g flo 200ml

 Bronze beetles Lannate L 120ml (Note 1)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Post blossom\* Anthracnose Switch (Note 3)

 Rust copper spray label rates

 Mealy bug, scale Movento

 Leaf roller, thrips #spinosad 40ml Lannate L 120ml

 Phytophthora #phosphorous acid (Note 2)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Post harvest Leaf spot, rust, blast copper spray label rates

as required Phytophthora #phosphorous acid

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# **No label claim exists for this product. Any use is at grower’s own risk \* Only choose chemicals suited to the markets intended**

**Note 1: Lannate should only be applied in the evening after bees have stopped flying**

**Note 2: Phosphorous acid has caused some phytotoxicity on fruit of some varieties. Do a check before using generally**

**Note 3: Do not use more than 2 applications**

**2018/19 WITHHOLDING PERIODS:**

The following withholding periods apply for materials used on blueberries for **the markets specified** and are the times that must elapse between the last spray and harvesting in **whole** days. If sending to a combination of markets, the longest withholding period applies.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | **NZ** | **Australia** | **Taiwan** | **Codex** |
| **Chemical** | **Example Product** | **Tolerance (mg/kg)** | **Withholding period (days)** | **Tolerance (mg/kg)** | **Withholding period (days)** | **Tolerance (mg/kg)** | **Withholding period (days)** | **Tolerance (mg/kg)** | **Withholding period (days)** |
| #buprofezin | Applaud | NL | **NS** | 0.05 | **NS** | NL | **BF** | NL | **BF** |
| #chlorothalonil | Bravo | NL | **BF** | 0.05 | **BF** | NL | **BF** | NL | **BF** |
| #chlorpyrifos | Lorsban | 0.2 | **NS** | NL | **Note 1** | 1 | **NS** | NL | **BF** |
| captan | Captan | 10 | **1** | 20 | **1** | 20 | **1** | 20 | **1** |
| #carbendazim | Goldazim | 5 | **3** | NL | **Note 1** | 2 | **NS** | 1 | **NS** |
| copper sprays: | Nordox | Exempt | **Nil** | Exempt | **Nil** | Exempt | **Nil** | NL | **BF** |
| cyprodinil/fludioxonil | Switch | 0.5/0.5 | **28** | 3/3 | **28** | 3/2 | **3** | 10/2 | **3** |
| #propiconazole | Tilt | NL | **BF** | 2 | **NS** | 2 | **NS** | NL | **BF** |
| #pyrethrins | Pyrethrum | 1 | **NS** | 1 | **BF** | NL | **NS** | NL | **BF** |
| #spinosad | Success | NL | **NS** | 0.7 | **7** | 0.4 | **7** | 0.4 | **7** |
| methomyl  | Lannate | 0.5 | **2** | 2 | **2** | 2 | **2** | NL | **28** |
| mancozeb: | Manzate | 7 | **14** | 15 | **14** | 5 | **14** | NL | **BF** |
| spirotetremat | Movento | 0.7 | **7** | 2 | **Note 1** | NL | **BF** | 1.5 | **3** |
| #ziram | Mizar | 7 | **28** | 15 | **28** | 5 | **28** | NL | **BF** |

Other materials and other export destinations: Use products only before flowering or check with Geoff Langford of Berryworld, ph 021 1420619, e-mail Geoff.Berryworld@gmail.com about use options. Mineral oils and biological products are not usually covered by residue tolerances and are normally exempt

BF: Use only before flowering or after harvest NS: No information available to set a withholding period NL: Not listed – normally non detectable is required although a default level of 0.1mg/kg applies in New Zealand and Canada

# No label claim exists for this product. Any use is at grower’s own risk

Note 1: Australia will normally accept tolerances established in New Zealand on imported produce

**The above notes on pest and disease control and pesticide residues are presented after consideration of the information available. However no assurances can be given on pest and disease control, or that plant damage will not result from use of this information. No assurances are given that produce, treated with chemicals according to the above list will be acceptable to the countries to which it may be exported. Berryworld Ltd and Blueberries New Zealand Inc disclaim all liabilities arising from the use of the above information. If in doubt contact your exporter or adviser.**

Revised May 2018

  **B. FRESH BLUEBERRIES**

**B.1 HARVESTING GUIDELINES**

Pickers have an important effect on quality, so a trained supervisor should closely monitor their performance.

Pickers must only pick in designated areas to ensure that berries with unacceptable spray residue levels are not harvested.

It is recommended that pickers do not pick into containers deeper than 100 mm.

Fruit should be randomly sampled to guide harvest timing to maximize sweetness as determined by taste test or brix level.

A high level of bloom is desirable.

**It is important to get fruit into a cool chain environment as soon as possible.**

**Pickers must observe safe food handling practices.**

**B.2 GENERAL FRUIT HANDLING GUIDELINES**

At each pick, ensure that all the ripe blueberries are harvested. Berries left behind will most likely be over ripe and soft at the next picking.

Picked blueberries must be kept in the shade in the paddock before being taken to the packing shed. The berries should have their field heat removed as soon after picking as practical. Once at the packing shed they should be removed from unventilated containers and spread on to trays with ventilation. Berries left in containers for any length of time continue to heat up and become soft.

Remove any berries at grading that have a wet scar, unless this is a variety characteristic. Blueberries with a wet scar will break down rapidly after being packed and spoil good fruit by leaking juice, thus causing rots.

Check fruit from each picker. Some pickers may tend to get more soft fruit.

Do not pick in to deep containers. Anything over 100 mm will tend to squash bottom berries.

Where possible, only pick in the early morning or cool of evening, avoiding the heat of the day.

Supervisors need to watch soft fruit more closely up until 5 days after heavy rain.

$2.50? / kg for process fruit is more economic than a fresh rejection.

Different blueberry varieties have characteristics that may require specific handling such as wet scars, acidity levels and colour.

Transporting blueberries from the field to the packhouse can cause damage if not done carefully.

**B.3 PACKER RESPONSIBILITIES**

* To have appropriate facilities (location, equipment and adequate lighting) for quality control inspection and auditing.
* To carry out quality control on a regular basis and randomly sample each line.
* Lines leaving the packhouse to be accompanied by a quality control sheet to assist Quality Assessors and Auditors with their assessments.
* Apply registered Grower number or name to all cartons.
* Pack product to Exporter/importer requirements.
* Record sufficient information to be able to trace back as far as practical where fruit has originated from. This may save significants costs in the event of a recall of product.

## B.4 QUALITY CONTROLLER RESPONSIBILITIES

* Every packhouse needs to appoint a Quality Controller who is responsible for ensuring that all quality specifications are adhered to.
* Advise the packhouse manager of pest and disease sightings and ensure the correct action is taken.
* Ensure fruit is packed to Industry specifications.
* Monitor the quality of packed fruit by taking representative samples at intervals, as outlined in Section B.4.2.
* Fully complete all quality control records and ensure each consignment is dispatched with quality control records.

### B.4.1 FACILITIES AND EQUIPMENT REQUIREMENTS

An area which is clean, well lit and safe.

An inspection bench which is:

- of a suitable size

- clean and an easily cleaned surface

- good access to facilities

- clear of main traffic areas

- clear of non-essential materials

Other equipment

- accurate metric scale

- magnifying glass (x 10)

- copy of export company's specifications

- quality control record sheets

- quality control handbook

- calculator

### B.4.2 SAMPLING FREQUENCY - Standard Method

The purpose of quality checks is to identify any problems with fruit before it is distributed. It is in your best interest to ensure that your samples reflect the general quality of the fruit being packed. The frequency may depend on the quality of the fruit you are packing.

A quality control check should be conducted within 10 minutes of commencement of packing, and again every 45 minutes or 40, trays whichever happens first.

At the completion of each quality control check, leave an identification mark (e.g. chalk mark), so that you know that product is within grade up to that mark.

The berries in a punnet must be counted so percentages can be worked out.

**A minimum of 600 fruit per grower line per day must be sampled, no matter how small the line.**

### B.4.3 EXAMINATION PROCEDURE

**Fresh Blueberries**

Each punnet should be tipped on a white surface and the individual berries inspected, with as little handling as possible, in order to minimize bloom removal. Any out of grade berries are to be recorded on the Quality Control Record Sheet.

No decision should be made on just one punnet from a line. The greater the number of punnets inspected, the more accurate the picture.

**Calculating the % Defects**

QC Sampling involves taking one punnet of fruit, which contains approximately 80 - 160 berries, depending on the variety and the punnet size. From the number of berries, the percentage of defects in the punnet should be calculated as follows:

Number of defects divided by number of berries in sample x 100 = % defects

E.g.: (2 defects / 102 berries in sample) x 100 = 1.96% (round up to 2%)

If you calculator has a % button then divide the number of defects by the number of berries in the sample and push the % button on the calculator.

### B.4.4 RECORDING OF RESULTS (Documentation)

The word "documentation" means having a **"written record"**. It is proof or evidence that a certain situation exists. A person's spoken word is not enough proof that a line of produce is of a specified export standard.

In completing the quality control check, each sample is to be recorded in a separate column on the Quality Control Sheet.

Defects are categorized so a decision can be made.

Quality Control Record Sheets must accompany each consignment. Note for those with electronic records this also applies.

Line Coding - Apply the Quality Control number to all trays corresponding to that Quality Control Sheet.

**Note:** The Blueberries NZ (Inc.) Auditor will not be concerned if the Quality Controller has recorded one sample to be out of grade, as long as some appropriate action as been taken and the action recorded to rectify the problem.

##

## B.5 FRESH BLUEBERRY QUALITY CONTROL ASSESSMENT RECORD

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Grower:** | **Block ID** | **Variety** | **No. Trays** | **Block ID** | **Variety** | **No. Trays** |
| **Grower No:** |  |  |  |  |  |  |
| **Packhouse:** |  |  |  |  |  |  |
| **Quality Controller:** |  |  |  |  |  |  |
| **Date Fruit Picked:** | **Date Fruit Packed:** | **Date Dispatched from Packhouse:** |
| The following boxes have been left blank to enable you to complete additional customs details if required. |
|  |  |
| \*Time or # of trays checked since last check  |  |  |  |  |  |  |  |  |  |  |  |  |
| Sample Size |  |  |  |  |  |  |  |  |  |  |  |  |
| **\*Sampling must be based on the Standard Method or the Alternative Method as detailed in Sect A8 of the Blueberry Quality Manual** |
| **1. Major Defects**  | **Accept 1%, Reject 2% (Refer Section A14 in Blueberry Quality Manual)** |
| **Crushed Berries** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Diseased/Progressive Rots** |  |  |  |  |  |  |  |  |  |  |  |  |
| Total Major Defects |  |  |  |  |  |  |  |  |  |  |  |  |
| % Major Defects |  |  |  |  |  |  |  |  |  |  |  |  |
|  |
| **2. Cosmetic Defects** | **Accept 5%, Reject 6% (Refer Section A14 in Blueberry Quality Manual)** |
| **Punctures, Cuts, Splits** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Surface Juice, Torn Scars** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Soft, Bruised** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Other defects (specify)** |  |  |  |  |  |  |  |  |  |  |  |  |
| Total Cosmetic Defects |  |  |  |  |  |  |  |  |  |  |  |  |
| % Cosmetic Defects |  |  |  |  |  |  |  |  |  |  |  |  |
|  |
| 3. Maturity (Refer Section A14 & A17 in Blueberry Quality Manual) | **Accept 5%, Reject 6%** A maximum of 20 percent of the surface of a single berry is allowed to be red/purple dependent of the varietal characteristics. Any berry with greater than 20% red/purple is considered immature and must be counted as immature in this section. |
| **Immature (> 20% red/purple)** |  |  |  |  |  |  |  |  |  |  |  |  |
| Total Immature |  |  |  |  |  |  |  |  |  |  |  |  |
| % Immature |  |  |  |  |  |  |  |  |  |  |  |  |
| **General Product Requirements****Cleanliness**  - Free from dirt, spray/fertiliser residue or other foreign substances.**Shape** - Reasonably well formed, typical of variety and not more than slightly misshapen.**Size** - Blueberries in each punnet must be uniform i.e. evenness of size in the punnet, of the same variety, quality and degree of ripeness. |
| 4. Pests | *Put the total number of each type of pest you see in each inspection in the appropriate column. This section will be used by the exporter as an indication of market suitability.* |
| **Thrips** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Scale** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Mealy Bugs** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Aphids** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Leaf roller** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Egg Masses** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Other** |  |  |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | ******** | **DON’T FORGET!**Apply the grower number or name to all trays.Send this form to your exporter with the consignment. | **Other Comments (for Exporter Information)** |
|  |  |  |  |
|  |  |  |  |

## B.6 QUALITY CONTROLLER

**Action Procedures**

Once the sheets have been filled in, the Quality Controller can then decide what action to take.

Does the total number of defects for that sample exceed the specification?

**If NO** - Continue monitoring, as per **B4**

**If YES -** Inform the Packhouse Manager of a reject situation

* Segregate and mark as non-export, all product from last sample
* Ascertain why product is not up to specifications. This information is available from the Inspection Record Sheet.
* Record what action you took to rectify the problem - e.g. slowed down grader.

## B.7 DEFINITIONS

A line of blueberries is a series of trays of the same variety from one grower.

To inspect a tray means to visibly examine all the fruit in the appropriate sub-sample (i.e. whole punnet) for all the defects listed in the specifications.

To record the quality of a line means to record either the presence of a defect or the percentage of berries with a defect, as appropriate, on the approved record form, and to complete all the required supplementary information on the form.

### B.7.1 Fresh Export Blueberry Grade Standards Blueberries NZ (Inc.)

This Grade Standard will apply to all fresh Blueberries exported from New Zealand.

**Cosmetic Defects**

Allowance for Cosmetic Defects is 5% - this is a straight percentage - e.g. 5

 100

**Damaged Fruit:**

For a visual guide refer to the Blueberry defects chart.

"Damaged" includes cuts, punctures, torn scars, splits, cracks, hail damage, chewed calyx, frost damage, surface russeting, deformed fruit, bruised fruit and any other readily noticeable damage.

Any damage in this category has to be relatively noticeable.

* Surface russeting - defined as any brown blemish or brown mark on the berry. Up to an aggregate area of 2mm squared is acceptable.
* Torn scars - a small tear is acceptable, large tears exposing the flesh are not.
* Bruised fruit/wet fruit that is soft and weeping is unacceptable.
* Fruit wet from juice is unacceptable.

**Cap Stems:**

All cap stems to be removed.

**Clusters:**

These are not to be present.

**Maturity:**

Over-mature must not be present

**Dirty:**

Spray / fertilizer residue, Bird droppings, etc. must not be present

**Colour:**

Allowance for colour defects is 5% - this is a straight percentage e.g. 5

100

Fruit must be a uniform blue, in accordance with the varietal characteristics. An immature berry is defined as having greater than 20 percent of the berry surface red/purple. (please refer to the guide chart)

The variety Delite is exempt from the above. This variety is acceptable with a purple/blue hue colour over the entire berry. It must not be bright red and obviously immature.

**Major Defects**

Allowance for Major Defects is 1% - this is a straight percentage e.g. 1\_

 100

Crushed Berries

Diseased / Progressive Rots

Botrytis and Anthracnose

The Blueberries must be free of Major Defects

**NB: THERE IS NO MINIMUM SIZE REQUIREMENT (Exporters may have size requirements)** Blueberries in each package must be of the same variety, quality, degree of ripeness and relatively uniform in size. Uniformity of size is important for certain markets.

## B.8 GENERAL INFORMATION

**Packaging**

The materials must be new, clean and of a quality such as to avoid causing any external or internal damage to the produce. Packaging must be free of all foreign matter.

**Bloom**

The white, waxy powder on the surface of the fruit should be retained to the maximum possible.

**Grower Identification**

The Grower number or name must be clearly shown on each tray.

**Line Coding**

Each line of Blueberries to be coded by applying the quality control number to all trays corresponding to that Quality Control Sheet.

**Blueberries that are rejected**

Lines rejected for any reason must be regraded before they can be re-presented for inspection. Unless they are suitable for alternative market.

## B.9 FRUIT TEMPERATURE MANAGEMENT

**Good Temperature Management Is Essential For Good Fruit Quality!**

Growers should be under no illusion that they can produce fruit with good keeping quality without proper fruit temperature management. A common misconception with growers is that packhouse quality is the same as that seen on the retail shelf. Fruit quality deterioration occurs after the fruit has been consigned and is an indication of how the fruit was grown and handled.

Correct temperature management from harvest to consignment will not convert poor fruit into good fruit, but it will prevent the opposite from happening. As growers, you are well aware of the costs involved in growing, harvesting, grading and packing your crop. To jeopardise fruit quality at the last step by not following optimum post harvest handling procedures, just doesn't make business sense. Growers producing fruit with poor keeping quality are a handicap to an industry that relies on high quality as the main selling point.

Growers who produce large volumes (over 10 t) of fruit should have a temperature-controlled packhouse (if they don't already have one) in their short-medium term business plan. Existing packhouses can be insulated and air-conditioned without too much bother and the improvements in fruit quality will more than offset the expense.

*Rapid "field heat" removal from berries soon after harvest*

*will prolong shelf-life at retail level. Refrigeration is necessary*

*to remove this heat.*

Growers without temperature controlled packhouses should aim to reduce fruit temperatures by 5o C or more, prior to grading. There will be no moisture condensation ("sweating") if fruit temperature is slightly below packhouse temperature. Fruit should then be cooled rapidly after packing.

Growers with temperature controlled packhouses should reduce fruit temperatures to 10 - 15o C as soon as possible after harvest.

**Example**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Process** | **Harvesting****(am)** | **Coolstore****(1-3 hrs)** | **Grading****(< 1 hr)** | **Coolstore****(overnight)** | **Consign****(next day)** |
| Air Temp | 15 - 25o C | 2 - 4o C | 20 - 25o C | 2 - 4o C |  |
| Fruit Temp | 20 - 30o C | 15 - 20o C | 18 - 23o C | 8 - 10o C | 5 - 8o C |

Growers should aim to consign fruit as cool as possible. Fruit consigned at higher than 10o C will break down in transit or at retail.

Palletised pre-cooling is also advisable to reduce fruit temperatures to 2 - 4o C prior to consigning.

Fruit temperature in packed punnets, trays and pallets will reduce at best, very slowly, and in some cases can rise. Pre-cooling for 2 - 3 hours by forcing cool air with a fan and cover, is equivalent to 12 - 18 hours static cool storage.

**Transportation**

It is also important to ensure that the temperature is maintained during transportation. Any extreme warming or cooling (-0ºC to 10ºC) will have a detrimental effect on the shelf life of your product. Consultation with your transport operator is essential.

**Cooling soon after harvesting/grading is the key step**

**to cool chain management. At no point subsequent to**

**consigning does cooling have the same impact.**

**Taking cold fruit into a high humidity warm environment as is common in New Zealand summers will cause the fruit to sweat.**

**Many refrigerated horticultural transport companies are unable to ensure a continuous temperature below 10C so take care to not cool to very low temperatures.**

**The use of airlock loading is common in other parts of the world but not in the NZ Blueberry industry.**

# C. Frozen Blueberries

## C.1 FROZEN BLUEBERRY SPECIFICATIONS

### C.1.1 General Requirements

For **ALL** grades, fruit must be:

Free from objectionable flavour and odours (no fermentation);

Relatively free of insects or insect fragments;

Free of contamination, that is, chemical residues, bird dropping and/or foreign material.

Each pack or carton must have the grower's number or name, net weight and date or line code clearly displayed.

### C.1.2 Definition of Terms

**Size**

While there is no defined size for frozen fruit, packs should, where practical, be of uniform size. Special orders may require a specific size - e.g. under 12 mm.

**Colour**

Uniform, bright/dark blue; any off colour with more than 50% red/purple are counted against the sample.

**Absence of Defects**

Refers to the degree of freedom from leaves, green or undeveloped berries, berries damaged by insects or birds, cap stems and clusters.

**(Note:** Cap stems are small stems that attach the berry to the branch and clusters are three or more joined cap stems, with or without berries attached.)

**Character**

Sort out crushed, broken, mutilated and mushy fruit.

**General classification notes for frozen blueberries**

**Do not count if:**

* There is no brown scar in hail indent or misshapen;
* The berry is reasonable firm, reasonably fleshy practically whole and practically intact and will hold its shape when frozen;
* The split does not reveal white flesh of the berry

**Do count if:**

* The flesh of the berry has been penetrated - character category;
* If the fruit is mushy - character category;
* If there is significant brown scar tissue - defect category;
* The white flesh of the berry is very apparent - character category.
* Capstems in the sample must still be counted even if they are no longer attached to a berry

**C.1.3 Sampling**

**Number of Samples**

The number of boxes that must be sampled for a quality assessment depends on the **total number of boxes** of the fruit being processed. C7lists the number of boxes that must be sampled in any given line of fruit.

A minimum of one QC sample per every twenty cartons packed should be taken.

**Sample Size**

Weigh a 500gm sample

From the **full** sample of 500 gram, remove **all** items that will affect the grade, such as defective berries, stems and leaves, and classify the items isolated under the categories of:

* Colour
* Defects
* Character

**Identifying and Categorising Factors Affecting Product Grade**

**Weigh** the volume of berries that qualify under the colour and the character category and calculate the percentage by volume of each of the categories from the tables in section C10 and C11. You will need scales that are accurate to 1 gm increments.

**Count** the number of items that qualify under the defects category such as stems leaves green berries, berries with significant scars and pathologically defective berries.

**C.1.4 Factors Defining Quality**

**Colour**

Weigh and record the volume of **red/purple berries –** i.e. berries with more than half red purple colour, the points and the grade on the Quality Inspectors Record Sheet.

**Defects**

Defects in the sample (listed below) should be counted and the score for the categories **a - c** and the grade of category **d** taken from C12 and recorded on the Quality Inspectors Record Sheet.

**Green Berries**

Count the number of berries which contain a definite green cast

**Damaged and Under-developed Fruit**

Count the number of berries with wrinkled or tough skins, or fruit which is damaged from insects. Note that this does not refer overripe to fruit that has started to dehydrate.

**Capstems and Clusters**

**Capstems** are small stems which attached the berries to the plant. They may be single or joined in pairs. In either case, berries may or may not be attached.

**Clusters** are defined as three or more capstems joined together, with or without berries attached.

Count the number of capstems and clusters

**Large Stems, Leaves and Other Unwanted Material**

Ideally, there should be no leaves or large stems in the sample. If these are present they should be isolated. Estimate the total area. The grade should be calculated as follows:

**A =** Not more than 2 whole leaves or large stems;

Area between 0 and 12 mm square

**B =** Not more than 4 whole leaves or large stems;

Area between 12 and 20 mm square

**C =** Not more than 6 whole leaves or large stems;

Area between 20 and 25 mm square

**Character**

* Include all berries that are crushed, broken or mushy
* Weigh these berries
* Turn to **C11** and identify the appropriate score.

### C.1.5 Sample Grading

On the Quality Inspector Record Sheet, comment on **flavour / odour**.

The scores for **colour, defects** and **character** should be obtained from C10, C11 and C12 and recorded. The **defects** factor is subject to the **substitution rule** and this should be applied before the score for that factor is calculated.

The total score is calculated by adding together the scores of all three factors. The **final grade** obtained from the total score is shown below.

**Premium =** total score 95+

**A**  **=** total score 90 - 100

**B =** total score 80 - 89

**C =** total score 70 - 79

However, the **final grade** is subject to the **limiting rule** (see below)**.**

**Substitution Rule (for defects)**

The grading of the **defects,** and hence the over-all grading of the sample, may sometimes be **improved** by substituting excess items from one category to another. However, the following rules must be observed if **substitution** is employed:

**Green Berries**

If green berries are present in excess of the allowed numbers for any given grade, some may be substituted for damaged or under-developed fruit, so retaining a higher product grade. There is a limit to the **total** number of green berries permitted in each grade, regardless of which category they are in. The **maximum** total number is:

**A** 8 green berries

**B** 15 green berries

**C** 20 green berries

*For example - Refer to C12. If the sample contained 8 green berries and 2 damaged and under-developed fruit, the automatic grading would be B. However, if 3 of the green berries were substituted for damaged and under-developed fruit, there would then be 5 items in each category and the grading would be increased to A.*

**Capstems and Clusters**

If the sample has a larger number of capstems than allowed in any given grade and no clusters, some may be substituted for clusters. Three capstems are equivalent to one cluster. There is a limit to the **total** number of clusters allowed in each grade, regardless of the category they are in. The **maximum** total number is:

**A** 2 clusters

**B** 4 clusters

**C** 9 clusters

*For example -*

*Refer to C12, If the sample contained 18 capstems and no clusters, the automatic grading would be B. However, if 3 capstems were substituted for 1 cluster, there would then be 15 capstems recorded and 1 cluster, and the grading would be increased to A.*

**Limiting Rule (for final grade assessment)**

If the sample has:

a colour factor of Grade C

a character factor of Grade B or C

a defect factor of Grade B or C

**The** **final grade cannot exceed the lowest value**.

### C.1.6 Line Grading

The grading of a line depends on the grades of the individual samples taken. All the samples will not necessarily be of the same grade. C7 lists the number of boxes that are allowed to be **below** the anticipated grade before the **whole line** is downgraded.

## C.2 DEFINITIONS OF FREEZING METHODS

**IQF (Individual Quick Frozen)**

IQF may be achieved in 2 ways:

**Fluid Bed Freezing**

The product is fed to a depth of approximately 100 mm over a moving belt, which is inside a blast freezer or which has its own blast freezing equipment with low temperature, high velocity air movement. Product is frozen to -8o C within one hour.

**Tray Freezing**

The product is loaded to a depth of 100 mm into trays that have adequate ventilation holes. Trays are stacked inside a blast freezer. The product is frozen by high velocity, low temperature air movement. Product is frozen to -8o C in approximately 12 hours.

The freezing process in the above two categories will not be considered complete until the product temperature has reached -18o C at the thermal center, after thermal stabilisation.

**Box Freezing**

Fresh product is blast frozen in 10 kg cartons.

Quality will vary, depending on the various factors. Good results can be achieved if the following factors are observed:

* Fruit is firm and dry at time of freezing.
* If fruit is frozen to -5o C within 24 hours of being packed.

Quality will be variable if:

* Fruit is wet, soft or sweating from heat at the time of freezing.
* The length of time taken to freeze the product is extended.

**Note -** Washed fruit has a greater tendency to block together

**Fruit Washing**

Please note the New Zealand blueberry industry took several years to recover from un washed fruit carrying Hepatitis A reaching the market. This fruit could only be sold to a processor that could assure the health department that it would be cooked. In North America all frozen blueberries must be washed prior to freezing.

**Box freezing definition for Approved Cold Stores only:**

*"The fruit filled containers shall each day be placed in a sharp-freeze room (blast freezer) with sufficient air movement to allow fast cooling and freezing at the centre of the container."*

If blast-freezing facilities are unavailable, placement of fresh product should be arranged within any given freezer room to avoid large stocks of warm fruit and slow freezing rate.

The core temperature of all product shall achieve an average temperature of 0o C within 48 hours after delivery to the cold store, and -6o C within 6 days.

The fruit should not be scheduled for shipment until the center temperature of the frozen fruit is equalised with the freezer room temperature.

Cold store should be operating at -18o C within four weeks of season finishing.

**C.3 DEFINITIONS OF FROZEN PRODUCT**

**Freeflow**

Means the fruit will flow freely when tipped out of a box, without assistance.

*A tolerance of 10%* (1 kg in a 10 kg carton) shall be allowed for berries which are stuck together and are easily separated in the frozen state.

**Block Frozen**

Means that fruit is solidly frozen together.

**Note: Growers are encouraged to check their product after it has been in cold store for one week, to verify whether the line is freeflow or block frozen.**

**C.4 PACKAGING**

**Pack Size**

A 10 kg cardboard pack is the recommended size.

**Pack Printing**

All packs must have the grade clearly identified as different grades can become mixed in a cold store. The grower’s Berryfed number and the word "blueberries" must also be clearly marked on the pack.

The method of freezing (IQF or box frozen) is also to be marked on each package.

**C.5 HINTS FOR PACKING FROZEN BLUEBERRIES**

To obtain the best possible grading for frozen fruit:

Do not leave fresh fruit standing unchilled or unfrozen for any length of time. Place in freezer at regular intervals. If no freezer available, keep well chilled until freezing down.

Always ensure surfaces that boxes are to be packed on are kept free of berries, as squashed berries stain the boxes and suggest to the customer that what is inside may be poor quality.

Plastic liners should be placed in the correct end of the container and folded over - NOT TIED.

When transporting to a freezer, ensure transporting containers are clean and the fruit kept covered, to avoid dust and dirt contamination.

Observe personal hygiene when handling fruit - For example Ensure hands are washed, no smoking, Ensure clothing and hair do not contaminate fruit, etc.

If freezing fruit in a domestic freezer, remember this is not a blast freezer and is only capable of freezing a small amount per day. It is designed to hold product already frozen.

Previously frozen and thawed boxes may collapse if re-used. If re-using boxes, check that the boxes will not collapse.

**NOTES ON PACKAGING FOR FROZEN FRUIT**

**IQF**

IQF fruit requires more room than shatter pack or block frozen. It is recommended that 1.7 litres be allowed per kilogram.

**Freeflow Pack or Block Frozen**

When the fruit is frozen in the carton, the fruit will settle, and so it is recommended that 1.6 litres be allowed per kilogram.

**Pack Shape**

Some packs are better than others for the following reasons:

Filling a refrigerated container efficiently depends on an appropriate sized pack. **Note** - there is some variation in refrigerated containers.

Filling the pack with some automatic filling systems depends upon boxes being stable on a conveyor, so that the open carton will not tip over.

**C.6 QUALITY CONTROL GUIDELINES FOR FROZEN BLUEBERRIES**

Each packhouse should nominate at least one person to act as Quality Controller. There must be a Quality Controller present whenever fruit is being processed.

**Duties:**

* To ensure all fresh/frozen fruit passing through the packhouse is graded to the appropriate standard (i.e. A, B or C).
* Advise growers of the standard of their line.
* Complete a Quality Control Record for each checked line.

**Facilities**

Each Quality Controller should have access to the following equipment:

* A well lit area, free of dust and dirt
* Knife for cutting tape on cartons
* Set of scales for checking filled weight of cartons and a set accurate for 1 gm increments for weighing samples.
* Containers for holding samples and rejected fruit

**Procedure**

1. Remove a sample from the grading line with a sample container
2. Assess defects and enter the results on the Frozen Quality Control Record Sheet
3. Advise the packhouse supervisor of the grade
4. Check a sample carton for cleanliness, correct labeling, and weigh the carton to ensure the specified net weight is met.

**Sampling**

A 500 g container should be used to take a representative sample from the line.

A minimum of one QC sample per twenty boxes of blueberries packed should be taken.

**Recording**

All results are to be recorded on the Frozen Quality Control Record Sheet. Once results are recorded, the appropriate grade can be assigned by applying the tolerances. For colour defects, refer to Tables.

**Tolerances** (500 g sample)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Factor** | **Grade A** | **Grade B** | **Grade C** |
| 1 | Colour | 5% | 10% | 20% |
| 2 | Defects Damagedor UndevelopedGreen BerriesCap StemsClustersLeaf Parts | 4 berries4 berries12 cap stems1 clusterup to 1 cm2 | 8 berries9 berries25 cap stems41 cap stems4 clustersup to 1.5 cm2 | 10 berries14 berries8 clustersup to 2.5 cm2 |
| 3 | Character (crushed and mushy) | 5% | 9% | 17% |

Two additional grades are recognised for product failing to meet the above.

**JUICE I** Basically free of leaf and twigs (maximum 2.5 cm2) /500gm Sample with 75% plus bright/dark blue colouring

**JUICE II** Basically free of leaf and twigs (maximum 2.5 cm2) /500gm Sample with 50 - 75% plus bright/dark blue colouring

**C. 7 PACKAGES FOR EXAMINATION**

Below is the schedule of quality control samples that is required to ensure the standard is consistent.

|  |  |  |
| --- | --- | --- |
| **Total Number of****Cartons** | **Number of Sample****Cartons Required** | **Maximum Number of Grades Allowed Below Minimum Standard, Before whole Line is Down-Graded** |
| 1 - 3 | 1 | 0 |
| 4 - 10 | 2 | 0 |
| 11 - 15 | 3 | 0 |
| 16 - 25 | 4 | 0 |
| 26 - 30 | 5 | 1 |
| 31 - 50 | 6 | 1 |
| 51 - 70 | 7 | 1 |
| 71 - 90 | 8 | 1 |
| 91 - 120 | 9 | 1 |
| 121 - 150 | 10 | 2 |
| 151 - 180 | 11 | 2 |
| 181 - 210 | 12 | 2 |
| 211 - 250 | 13 | 2 |
| 251 - 280 | 14 | 2 |
| 281 - 310 | 15 | 2 |
| 311 - 340 | 16 | 2 |
| 341 - 370 | 17 | 2 |

**C. 8 TEMPERATURE LOG FOR FROZEN BLUEBERRIES**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Date****Received** | **Grower****Code** | **Date/Line****Code** **of Box** | **Consignment Code****Inwards Goods****Docket #** | **Inward****Temperature****Flesh** | **Blast Frozen Time Taken to Reach** **Desired Temperature** | **Temp of Product****into Holding****Cold Store** | **Freezing Method****IQF -****Box Frozen** |
|  |  |  |  |  |  |  |  |
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**C. 9 QUALITY INSPECTORS RECORD SHEET FOR FROZEN BLUEBERRIES**

Quality Controller.................................. Grower # ............................. Date ............................

Location .................................................. Freezing Method: IQF/Box Frozen/Other …………..

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Line Code or Pail Number*If using a stamp apply it here to ensure that QC’s can be traced to actual linecodes used* |  |  |  |  |  |  |  |
| Time of Sample |  |  |  |  |  |  |  |
| Clean Packaging |  |  |  |  |  |  |  |
| Flavour / Odour |  |  |  |  |  |  |  |
| Checkweight of Box/Pail |  |  |  |  |  |  |  |
| Size |  |  |  |  |  |  |  |
| No. of out-of-size berries (Tell supervisor if >5) |  |  |  |  |  |  |  |
| **Colour** | A 18 - 20B 16 - 17C\* 14 - 15Substd\*<14 | Weight. RED *POINTS*  GRADE GIVEN |  |  |  |  |  |  |  |
| **Defects** | A 36 - 40B\* 32 - 35C\* 28 - 31Substd\*<28 | No. GREEN*POINTS* GRADE GIVEN |  |  |  |  |  |  |  |
|  |  | No. DAMAGED/Underdeveloped *POINTS* GRADE GIVEN |  |  |  |  |  |  |  |
|  |  | No.CAPSTEMS*POINTS*GRADE GIVEN |  |  |  |  |  |  |  |
|  |  | No. CLUSTERS*POINTS*GRADE GIVEN |  |  |  |  |  |  |  |
|  |  | LEAF GRADE |  |  |  |  |  |  |  |
|  |  | *LOWEST DEFECT* *POINT SCORE* |  |  |  |  |  |  |  |
|  |  | OVERALL DEFECTS GRADE |  |  |  |  |  |  |  |
| **Character** | A 36 - 40B\* 32 - 35C\* 28 - 31Substd\* 28 | Weight CRUSHED *POINTS*  GRADE GIVEN |  |  |  |  |  |  |  |
| Total Score (Add  **+ + )** |  |  |  |  |  |  |  |
| Final Grade\* |  |  |  |  |  |  |  |

\* Limiting rules apply

**Please record action taken with any fruit that does not meet minimum specifications on the back of this page.**

**C. 10 GRADE SCORING FOR COLOUR CATEGORY (REDS**)

|  |  |  |  |
| --- | --- | --- | --- |
| **Grade** | **Points** | **Grams** | **% Red in 500gm** |
|  | **20** | **0-5** | **0-1%** |
| **A** | **19** | **5.1-15.5** | **1.1-3.0%** |
|  | **18** | **15.6-25** | **3.1-5%** |
| **B** | **17** | **25.1-35** | **5.1-7%** |
|  | **16** | **35.1-50** | **7.1-10%** |
| **C\*** | **15** | **50.1-75** | **10.1-15%** |
|  | **14** | **75.1-100** | **15.1-20%** |
| **Substandard** | **0-13** | **100.1+** | **OVER 20%** |

**C. 11 GRADE SCORING FOR CHARACTER CATEGORY (CRUSHED & MUSHY)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Grade** | **Points** | **Grams** | **% in 500 gm** |
|  | **40** | **0-4.5** | **0-1.0%** |
|  | **39** | **4.6-9.1** | **1.1-2.0%** |
| **A** | **38** | **9.2-13.6** | **2.1-3.0%** |
|  | **37** | **13.7-18.1** | **3.1-4.0%** |
|  | **36** | **18.2-22.7** | **4.1-5.0%** |
|  | **35** | **22.8-27.2** | **5.1-6.0%** |
| **B** | **34** | **27.3-31.7** | **6.1-7.0%** |
|  | **33** | **31.8-36.3** | **7.1-8.0%** |
|  | **32** | **36.4-40.8** | **8.1-9.0%** |
|  | **31** | **40.9-49.9** | **9.1-11.0%** |
| **C** | **30** | **50.0-59.0** | **11.1-13.0%** |
|  | **29** | **59.1-68.0** | **13.1-15.0%** |
|  | **28** | **68.1-77.1** | **15.1-17.0%** |
| **Substandard** | **0-27** | **OVER 77.1** | **Over 17%** |

**C. 12 GRADE SCORING FOR DEFECT CATEGORIES**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Grade** | **Points** | **Green Berries** | **Damaged & under-developed** | **Cap stems** | **Clusters** | **Large stems and leaves** |
|  | **40** | **0** | **0** | **0-2** | **0** |  |
|  | **39** | **1** | **1** | **3-5** | **-** |  |
| **A\*** | **38** | **2** | **2** | **6-8** | **1** |  |
|  | **37** | **3** | **3** | **9-11** | **-** | **12x12mm** |
|  | **36** | **4-5** | **4-5** | **12-15** | **2** |  |
|  |  | **Max 8 Green** | **Max 2 Clusters** |  |
|  | **35** | **6** | **6** | **16-18** | **3** |  |
|  | **34** | **7** | **7** | **19-21** | **-** |  |
| **B\*** | **33** | **8** | **8** | **22-24** | **4** |  |
|  | **32** | **9-10** | **-** | **25-27** | **-** | **20x20mm** |
|  |  | **Max 15 Green** | **Max 4 Clusters** |  |
|  | **31** | **11** | **9** | **28-32** | **5-6** |  |
|  | **30** | **12** | **-** | **33-36** | **7** |  |
| **C\*** | **29** | **13** | **10** | **37-40** | **8** |  |
|  | **28** | **14-15** | **-** | **41-44** | **9** | **25x25mm** |
|  |  | **Max 20 Green** | **Max 9 Clusters** |  |
| **Substd\*** | **27** | **15+** | **10+** | **44+** | **9+** | **Over 25mm2** |

**C. 13 LINE CODING**

Each carton is to be **line** coded to enable traceability of product. Following is a suggested linecode format.

All line codes start at 1 December. The first two figures indicate the day. The second two figures indicate the line for that day. The third two figures indicate the season the fruit was packed, this number is decided by the year into which the majority of the season falls i.e. January, Feb, March.

For example:

14/03/04 = 3rd line of cartons on 14 December 2003

40/26/04 = 26th line of cartons on 09 January 2004

25/01/05 = 1st line of cartons on Christmas Day 2004

The 40/26/04 example above recognises the 31 days of December and the 9 days of January.

A line of blueberries is a series of cartons with fruit of similar characteristics.

**Explanatory Note**

Examples of factors which may lead to a day's pick being submitted as several lines,

are:

* fruit from different blocks with different incidence of disease
* different varieties of fruit
* different sizes etc
* Breakdowns of machinery that may lead to recall or require separation at a later date
* Changes of shifts

This code should be applied to the quality control sheet relating to the line.

**C. 14 COLD STORES**

The freezing down and cold storage of your blueberries is essential to maintaining the quality of your product. Ensure that the Cold store facilities you use understand the requirements of the product. It is recommended that you check your products and documentation regularly.

**D. EXPORTER ROLES**

**D. 1 EXPORTER ROLES AND RESPONSIBILITIES**

Exporters must be registered with the Blueberries NZ (Inc.).

Contact: Jan Bishell Secretary

 Blueberries NZ

 PO Box 13029

 Hamilton

* **Ensure your growers are registered for export and they have submitted their spray diary to the Blueberries NZ (Inc.) Quality Manager (Geoff Langford), and check the grower has had market clearance as part of the residue testing program.**
* Ensure that the product for which certification is required, complies with Industry specification where applicable, and those of the importing country.
* See link to importing countries phytosanitary requirements: <http://www.biosecurity.govt.nz/regs/exports/plants/icpr/search>
* Ensure that the packhouse is able to handle the product and grade to specification.
* Ensure that the packer has packaging that is suitable for the storage and transport of the product.
* Ensure that all agreed documentation systems are adhered to.
* Arrange for product to be assessed for end point and pre-clearance if required.
* Ensure that the facilities for the assessor are suitable for the work to be done effectively.
	+ - For OPI inspection, facilities must meet the workplan requirements, attachment 5, page 37 of link:
* <http://www.biosecurity.govt.nz/files/regs/exports/plants/workplan-fresh-fruit-vegetables-australia.pdf>
* Ensure that the necessary quality assessments are done and recorded.
* Ensure that the agreed documentation is available to your Independent Verification Agency (IVA) for the purposes of auditing.
* Ensure that cold store managers are aware of all fresh and frozen blueberry specifications and requirements.
* Ensure that fresh fruit held for SEVEN DAYS in exporter cool stores is rechecked for quality before exporting.

## D. 2 EXPORT QUALITY ASSESSOR

The Quality Assessor's role is to assess the quality control system of all packhouses supplying the exporter.

Assessing has two main components:

* Examination of all relevant documentation. Quality Control Sheets should be checked to make sure quality control is taking place and is being recorded.
* The use of a sampling scheme to ensure that the quality system produces a product which meets the export requirements.

**QUALITY ACCEPTANCE NUMBERS**

When a quality check is carried out there are two options in which the Export Quality Assessor can calculate the percent defects. The first option is as per “Quality Controller” method which is a direct percentage (refer section B4.3). The second option is the use of Maximum Pest Limit (MPL) tables which exporters should be using if they carry out their own endpoint inspections. The MPL is not a direct percentage calculation, it’s statistically designed to give a higher confidence level. This means a larger sample, but the acceptance figures remain similar. Either option is acceptable for a quailty grade check.

Table one outlines the conversions to use if you are carrying out a grade inspection using MPL tables, e.g, the MPL % to use is 3% for major defects.

Table two outlines what acceptance numbers to use when using MPL’s, e.g. for a sample size of 120 berries, the acceptance for major decfects is 0 (3% MPL), and for minor defects (10% MPL) the acceptance number is 6.

NB: The smallest quality check sample on Exporter Quality Assessor can take is 120 based on the lowest MPL being 3% (Major Defect Limit) however it is recommended that at least 300 fruit per line are inspected for a grade sample check.

**Table 1. Conversion table for blueberries from Quality Controller % to MPL %**

|  |  |  |
| --- | --- | --- |
| **Defects/ Pest Limit** | **+MPL (%)** | **\*Quality Controller (%)** |
| Major Defects | 3 | 1 |
| Minor Defects | 10 | 5 |
| Colour Defects | 10 | 5 |
| MPL Pest Limit\*\* | 0.5, 5 or 10 |  |

\*\* Check Importing Country Requirements to establish what MPL % to use when determining what the pest limit is.

\*Based on a one punnet sample, and calculated manually as a straight percentage

+Based on MAF MPL TABLES and a lot size of 10 000+ (i.e. a line of 10 000 individual blueberries or more)

NB: The smallest sample on Exporter Quality Assessor can take is 120 based on the lowest MPL being 3.

Table 2: Acceptance numbers dependent on sample size and MPL % used.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sample Size\*** | **MPL 0.5%** | **MPL 3%** | **MPL 5%** | **MPL 10%** |
| 60-89 |  |  | 0 | 1 |
| 90-119 |  |  | 0 | 4 |
| 120-149 |  | 0 | 1 | 6 |
| 150-179 |  | 0 | 2 | 8 |
| 180-209 |  | 1 | 3 | 11 |
| 210-239 |  | 2 | 5 | 13 |
| 240-269 |  | 2 | 6 | 16 |
| 270-299 |  | 3 | 7 | 18 |
| 300-329 |  | 3 | 8 | 21 |
| 330-359 |  | 4 | 9 | 23 |
| 360-389 |  | 5 | 10 | 26 |
| 390-419 |  | 5 | 12 | 28 |
| 420-449 |  | 6 | 13 | 31 |
| 450-479 |  | 7 | 14 | 34 |
| 480-509 |  | 8 | 15 | 36 |
| 510-539 |  | 8 | 17 | 39 |
| 540-569 |  | 9 | 18 | 42 |
| 570-599 |  | 10 | 19 | 44 |
| 600 -629 | 0 | 10 | 20 | 47 |
| 630 - 659 | 0 | 11 | 22 | 50 |
| 660 - 689 | 0 | 12 | 23 | 53 |
| 690 - 719 | 0 | 13 | 24 | 55 |
| 720 - 749 | 0 | 13 | 26 | 58 |
| 750 - 779 | 0 | 14 | 27 | 61 |
| 780 - 809 | 0 | 15 | 28 | 63 |
| 810 - 839 | 0 | 16 | 30 | 66 |
| 840 - 869 | 0 | 16 | 31 | 69 |
| 870 - 899 | 0 | 17 | 32 | 72 |

\* Based on a lot size of 10 000+ (i.e. a line of 10 000 individual blueberries or more)

## D. 3 CORRECTIVE ACTIONS

**Fruit Failing to Meet Specifications**

* If the number of defects found in the sample is greater than the acceptance number, then the fruit from that packhouse is unacceptable for export.
* Identify and segregate any fruit which does not meet specifications.
* Record actions taken to sell non-conforming fruit
* Records of sale for non-conforming fruit must also be kept on file for auditing.
* If a line is regraded it must be reassessed before it can be accepted for export and a record of the reassessment kept accordingly.
* Lines rejected for any reason must be re-graded before they can be re-presented for inspection before exporting.

**Failure of the Packhouse Quality System**

* Identify where breakdowns have occurred in the quality control system.
* Inform the packhouse management that their quality control system is **not** adequate.
* Ensure that all further submissions are assessed until the exporter quality assessor is confident that the quality control system is again effective.

**D. 4 LEVELS OF CONFIDENCE**

The number of assessments of a supplier each week, will depend on the level of confidence that the exporter Quality Assessor has in the packhouse quality system.

**Confident**

Fruit has passed examination on three consecutive audits

Well kept records

Packhouse has a positive attitude towards the quality system

QC records are consistent with the Quality Assessor's.

**Unsure**

Fruit passed examination

Records NOT well kept

Packhouse has a negative attitude

**Not Confident**

Fruit failed examination

No QC record sheet

QC record sheets inconsistent with Quality Assessor's

**4. 5 ASSESSMENT FREQUENCY**

**Confident**

Assess each packhouse at least once within every three days of that packhouse packing blueberries.

**Not Confident**

End Point quality control to be carried out.

End point quality control procedure - single stage sampling for large lots.

**Step 1** Select a tray of blueberries. Examine the selected sample of blueberries. Once a punnet is selected, **all the blueberries** must be examined.

**Step 2** Record the types of defects and the total defects on the report form. Calculate the running totals for the respective defect categories.

**Step 3** A minimum of 120 blueberries is to be inspected. This is not the optimal number, but the bare minimum. If the total number of units examined is less than 120, go back to Step 1, otherwise, continue on to Step 4.

**Step 4** On the report form we have the total number of blueberries inspected and the number of defectives under each category. Compare for each defect category, the number of defectives, with the appropriate acceptance number (Table 2) as such:

If the number of defectives is less than or equal to the acceptance number for all categories, then the lot satisfies the required MPL.

If the number of defectives is greater than the acceptance number, the lot does not satisfy the required MPL.

**Acceptance Numbers**

Explanation: An MPL is not an exact percentage calculation.

The MPL is designed to give a higher confidence level, that nominated maximum level of defects is not exceeded. This means a larger sample, but the acceptance figures remain similar.

**Conversion table for blueberries from Quality Controller to Auditor**

|  |  |  |
| --- | --- | --- |
| **Quality Controller** | **MPL** | **Defects/Pests** |
| 155 | 31010 | Major DefectsMinor Defects 10Colour Defects 10 |

**D. 6 REQUIREMENTS FOR COOL STORAGE**

The desirable storage temperature for fresh blueberries is 2 - 5o C.

Removal of field heat to at least 5o C should be undertaken within 24 hours of harvest. The higher the temperature at harvest, the quicker the fruit needs to be cooled in order to achieve maximum storage life. However, if fruit is to be fumigated it is advised to reduce field heat to 15o C and then chill to 2o C immediately after fumigation. Temperature fluctuation should be avoided.

All fruit must immediately go into a suitable coolstore at the freight forwarders, after transportation from the packhouse.