

The Best Practice Guide for UK Plum Production

Harvesting and Storing Plums

Tom Hulme, A C Hulme & Sons

Dr Oliver Doubleday, G H Dean & Co

Paul Hamlyn, A C Hulme & Sons

Charles Highwood, S W Highwood & Sons

Prof Jerry Cross, NIAB EMR

Introduction

Efficient harvesting and storage is one of the most important challenges in profitable plum production. Here we set out some of the particular challenges of harvesting and storing the crop, with best practice guidance on how to meet those challenges based on the experience of some of the UK's most experienced and successful plum growers.

Knowledge of market specification(s)

It is absolutely vital to know the intended customer for the fruit and the customer's market specification. This includes:

- Minimum and maximum size for the variety
- Minimum sugar content (°Brix)
- Minimum % colour (i.e. the minimum percentage of the surface of each fruit which must be coloured)
- Minimum firmness
- Tolerance of blemishes (scarring), including size and frequency (%)
- Cumulative tolerance (%) of defects (blemishes, bruising etc.)

Attributes for which there is likely to be zero tolerance, resulting in rejection of the consignment:

- Presence of any 'Bladdery' fruit i.e. that which is overripe, likely to split on handling, watery, rotting or which is starting to degrade
- Presence of any splitting or rotting fruit
- Presence of insect pests or other invertebrates (SWD eggs or very young larvae may not be visible and will remain so if the fruit is kept cold)

Attributes that may be accepted:

- Limited natural gumming

The specification may vary according to the market (e.g. the multiple retailer). Most fruit must comply with a 'standard' market specification which requires firm (somewhat under ripe) fruit which is easier to handle and has a longer shelf life. However, some retailers provide a premium price for high taste quality 'tree ripe' fruit which, being riper, and a superior eating experience has a higher sugar (°Brix) and colour specification, is likely to be softer and juicier and therefore more challenging to handle and can only be stored for a short duration.

Decision of when to harvest

Harvest must commence when the threshold minimum values for % fruit surface colour and °Brix are both reached. In the run up to the start of picking, the orchard should be inspected every day and more frequently if possible during warm weather. It is important to ensure that the orchard is properly inspected, since there often parts of orchards with fruit that is more ripe or and other parts with fruit that is less than the overall average. As soon as a significant proportion of fruits have attained the minimum % colour (every fruit must have the minimum percentage of its surface coloured) and °Brix, picking must commence. % colour is assessed by eye, °Brix using a refractometer. Typical requirements for Victoria are > 50% colour, > 10°Brix, but there is considerable variation between markets. Varieties like Opal and Victoria are likely to require 5-6 picks at 2-3 day intervals, depending on weather, with shorter intervals in warm weather.

The picking operation

Picking is usually done by supervised gangs of pickers. Fruit is harvested into picking buckets, and is then transferred to 10 kg trays. To avoid mistakes pickers are often instructed to pick to a higher % surface colour than the minimum required by the market specification (e.g. instructed to pick for 50% colour for a market specification of 30% colour). The supervisor must inspect all trays to ensure every picker is achieving the required results consistently. Sensitive varieties (e.g. those subject to bruising such as gages) may be picked directly into trays or punnets. Tree ripe fruits are normally picked directly into punnets. Damaged fruits must be discarded onto the ground. However, on thin skinned and late picked varieties which are at greatest risk from SWD or where tree ripe fruit is being produced, the damaged fruit should be collected separately and removed from the orchard, to prevent the build-up of SWD.

- Don't pick wet fruit

Feedback from the packhouse

Regular, immediate feedback from the packhouse to the picking supervisor on the quality of the fruit is vital, so that the picking operation can be adjusted if the market specification is not being met (or is being unnecessarily exceeded).

Short term storage

The harvested fruit needs to be transferred to a cold storage (at 1°C) as soon as possible, and within 2 hours at most. It should be remembered that at ambient temperature plums will continue to ripen after picking. Hydro-cooling is the fastest way to cool fruit, but it requires specialist equipment that few growers will have. If using a hydrocooler water sanitation is important to prevent the promotion of rots. Air cooling takes longer but is satisfactory if simple rules are observed. Air cooling is most efficient if there is air movement around the fruit so that warm air is taken off the fruit as quickly as possible. The design for plenum chambers and appropriate fans to achieve good cooling are given in “Commercial Cooling of Fruit, Vegetables and Flowers” University of California Agriculture and Natural Resources Publication 21567. In the absence of forced air cooling it is sensible to reduce the height of stacks in cold stores and to space pallets reasonably far apart to promote air circulation. Remember that for every hour late, 1 day's storage and shelf life can be lost. Trays of fruit are normally held on pallets (typically 50 trays/pallet) for a short time (often a day or two) before grading.

Grading

Fruit should not be graded at 1°C. It should be removed from cold store and allowed to warm to 10-12°C before being tipped (gently!) onto a grader and packed into punnets.

Longer term storage (i.e. more than 5-10 days)

The storage life of plums is mainly limited by rotting and shriveling and varies greatly with variety and fruit condition. Some varieties are not suitable for longer term storage, nor is fruit that has been picked tree ripe. Fruit should not be picked wet or allowed to become wet by condensation as this will seriously limit suitability for storage. Varieties are scored for their suitability for storage in the database of preferred varieties set out in this best practice guide. Varieties that are suitable for longer term storage include Victoria, which is suitable for storage for up to 4 weeks. The AHDB storage recommendations for tree fruit should also be consulted. Fruit should be kept at or close to 0°C.

SmartFresh

SmartFresh is approved for use in plums and can be of benefit in some varieties (e.g. Victoria, Marjories Seedling) but cannot be used in others (e.g. Opal). Unfortunately, not enough work has been done to define the correct degree of ripeness whereby fruit will be susceptible to SmartFresh and will ripen when subsequently warmed to ambient temperature. If treatment is done too early, before adequate °Brix is reached, the fruit will never ripen, if too late the benefits will be reduced or zero. On Victoria, it has proved valuable for smoothing the marketing season early and late.

Disclaimer

The information contained within this Best Practice Guide is correct to the best of the authors' knowledge at the time of compilation but it must be understood that the biological material/systems and the regulatory framework referred to within these guides are subject to change over time. Anyone looking to make use of the information should check it against prevailing local conditions.

All pesticide recommendations and approvals are subject to change over time and the user of this Guide is reminded that it is his/her responsibility to ensure that any chemical intended for use by them is approved for use at the time of the intended application. The user is reminded that they must carefully read and follow the label on each chemical before applying any treatments.