# Harvest and storage losses of two apple cultivars in Jordan

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# HARVEST AND STORAGE LOSSES OF TWO APPLE CULTIVARS IN JORDAN

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**Abstract**

Until the first half of the 1980's Jordan used to import more than 40 thousand tons of apples in the value of $ 24 mil annually. This relatively high local demand for apples in Jordan encouraged growers in the private sector to invest and to establish modern new plantings. Today the area planted to apple trees is about 30 thousand dunums with an estimated annual production of more than 40 thousand tons. Part of the crop is marketed immediatly at harvest and the other part is placed in cold storage for a period of 5-7 months.

Due to the fact that apple growing and storage are new practices in Jordan man can see some shortages in the way apples are being handled at harvest and in recognising some of the major physiological storage disorders such as bitter pit or super ficial scald. No research has been conducted in Jordan to classify the losses that occur at harvest and during storage and to estimate their relevance.

## INTRODUCTION:

This work reports the following aspects:

a. Classification of the main types of losses at harvest and during storage.
b. Determination of the share and relevance of each type of these losses.
c. Enable growers to recognize the different types of losses.
d. Discuss and find ways and means to reduce or control these losses.

At harvest about 125 kg of apples of each of the cultivars Mor Spur and Starkrimson, both on MM 106 rootstock, from two orchards in the Shoubak area were evaluated for the following kinds of damage:

a. Bruising
b. Sunburn (Sunscald)
c. Russeting

Fruits unsuitable for storage were discarded and healthy fruits were then moved to cold storage (Temp. 1-3° C and 90% RH). During storage inspection for possible incidence of physiological disorders (bitter pit and superficial scald in addition to weight loss was practiced at monthly intervals until the end of the storage period which lasted 5 months.

## MATERIALS AND METHODS

Fruits of the cultivars Mor Spur and Starkrimson on MM 106 rootstock grown in two orchards (Hitteen and Zanoneh) in the Shoubak area were harvested on August 31. Immediatly after harvest the fruits were inspected for damage due to bruising or sunscald and for russeting and the number of fruits in each of these three categories recorded. The remaining healthy fruits were then filled in 25 kg plastic containers and placed in cold storage (1-3° C and 90% relative humidity) until January 31. During storage the fruits were evaluated at monthly intervals for the incidence of bitter pit, superficial scald and weight loss.

## RESULTS

The losses due to brusising damage, sunscald and Russeting and the number of evaluted fruits for Starkrimson and Mor Spur are shown in tables 1 and 2, respectively.

The results indicate that the cultivar Mor Spur was in both orchards more susceptible to sunscald and russeting than Starkrimson.

Weight loss, incidence of bitter pit and superficial scald are shown for both cultivars in tables 3 and 4. It is evident from these results that the cultivar Starkrimson was more subject to physiological disorders than Mor Spur. While weight loss ranged from 2.36-3.20% and 3,62-3,71 for Starkrimson and Mor Spur, respectively.

**Table 1.** Harvest losses of the apple cultivar Starkrimson in two orchards in Jordan

| Orchard | Bruising % | Sunscald % | Russet % | No. of evaluated fruits |
|---|---|---|---|---|
| Hitteen | 3.73 | 14.80 | 0.0 | 750 |
| Zanoneh | 1.60 | 1.12 | 1.12 | 624 |

**Table 2.** Harvest losses of the apple cultivar Mor Spur in two orchards in Jordan

| Orchard | Bruising % | Sunscald % | Russet % | No. of evaluated fruits |
|---|---|---|---|---|
| Hitteen | 15.27 | 16.76 | 28.95 | 753 |
| Zanoneh | 3.58 | 19.37 | 9.74 | 893 |

**Table 3.** Weight loss and incidence of bitter pit and superfical scald on Starkrimson apples during storage in two orchards in Jordan.

| Orchard | Weight loss % | Bitter Pit % | Superficial scald % |
|---|---|---|---|
| Hitteen | 3.20 | 3.58 | 8.58 |
| Zanoneh | 2.38 | 13.52 | 8.77 |

**Table 4.** Weight loss and incidence of bitter pit and superfical scald on Mor Spur apples during storage in two orchards in Jordan.

| Orchard | Weight loss % | Bitter Pit % | Superficial scald % |
|---|---|---|---|
| Hitteen | 3.71 | 0.0 | 2.00 |
| Zanoneh | 3.62 | 1.10 | 0.26 |

The results listed above indicate the importance of conducting further research using traditional and non traditional means to control or at least reduce the losses caused by sunburn, and physiological disorders.