AgriSun Solutions pty ltd

SWEET CHERRY APPLICATION GUIDE

Reflective Orchard Ground Film

Research-informed guidance for Regina, Lapins, Sweetheart, Santina, Skeena and Bing

1. PURPOSE OF THIS GUIDE

Reflective orchard ground film is used to alter the orchard light environment by redirecting a portion of available solar radiation from the orchard floor upward toward the canopy.

In sweet cherry production, canopy light can be relevant to:

- fruit skin colour,
- sugar accumulation,
- fruit firmness,
- fruit size,
- canopy uniformity,
- and post-harvest quality.

However, not all cultivars have the same published timing evidence.

This guide therefore separates:

PUBLISHED TIMING

A timing directly evaluated in peer-reviewed research.

from

SOUTH AFRICAN TRIAL REQUIRED

A cultivar where AgriSun should not yet prescribe a fixed timing without local evidence.

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2. THE STRONGEST CURRENT EVIDENCE — REGINA

SOUTHERN CHILE, 2025

A peer-reviewed 2025 study evaluated reflective ground film in a commercial sweet-cherry orchard of:

REGINA

grown under:

PLASTIC COVER

in:

SOUTHERN CHILE

The reflective film was used for:

21 DAYS BEFORE HARVEST

and

34 DAYS BEFORE HARVEST.

This provides one of the clearest directly researched reflective-film timing references currently available for sweet cherries.

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3. WHAT THE REGINA RESEARCH FOUND

The researchers measured fruit quality at harvest and also evaluated post-harvest fruit condition.

Reflective-film exposure was associated with several responses under the conditions of the experiment.

FRUIT FIRMNESS

Fruit from trees exposed to reflective film had increased firmness at harvest.

TOTAL SOLUBLE SOLIDS

Reflective-film treatment increased total soluble-solids content at harvest and reduced differences in sugar concentration between fruit from different canopy positions.

FRUIT SIZE

The **21-day treatment** increased the proportion of fruit larger than 32 mm in the upper part of the canopy compared with the untreated control.

FRUIT COLOUR

The **21-day treatment** increased the proportion of mahogany-coloured cherries in the lower canopy compared with untreated trees.

These findings demonstrate why reflective ground film can be of interest where growers are trying to improve the light environment around lower- or more shaded fruit.

However, the study also found important negative responses.

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4. THE TRADE-OFFS MATTER

CRACKING

The researchers reported increased cracking incidence in fruit exposed to reflective film in both upper and lower canopy zones.

PEDICEL BROWNING

Fruit from trees exposed to reflective film for **34 days before harvest** showed a higher incidence of pedicel browning after harvest.

POST-HARVEST CONDITION

The researchers also found changes in post-harvest defects including orange skin and pitting, with responses differing by canopy position.

This means the study should **not** be summarised simply as:

“Longer reflective-film exposure produces better cherries.”

That is not what the research showed.

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5. WHAT DOES THE REGINA STUDY MEAN PRACTICALLY?

The useful message is:

Reflective ground film altered fruit quality and maturity-related characteristics.

It also altered some fruit-condition defects.

Therefore:

THE APPLICATION PERIOD MATTERS.

The 21-day treatment produced several favourable responses in the experiment, including changes in fruit size and lower-canopy colour.

The 34-day treatment should **not** automatically be interpreted as superior simply because the film was down longer.

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6. REGINA — PUBLISHED TIMING

21 DAYS BEFORE HARVEST

Directly studied

and

34 DAYS BEFORE HARVEST

Directly studied

Important

These timings were evaluated specifically in:

Regina

grown:

under plastic cover

in:

southern Chile.

They should not automatically be presented as optimum timings for every Regina orchard or every cherry cultivar.

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7. WHERE REFLECTIVE FILM MAY BE RELEVANT IN REGINA

A grower may consider a controlled reflective-film trial where:

- lower-canopy fruit colours differently from upper-canopy fruit,
- canopy light is reduced by plastic covers,
- there are large differences in maturity between canopy positions,
- sugar levels vary substantially through the canopy,
- or fruit colour is affecting commercial grading.

Because cracking and post-harvest condition were affected in the Chilean research, these variables should always form part of the evaluation.

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8. WHAT TO MEASURE IN A REGINA TRIAL

BEFORE INSTALLATION

Record:

☐ Expected harvest date
☐ Fruit-development stage
☐ Existing fruit colour
☐ Canopy position
☐ Existing cracking
☐ Plastic-cover type
☐ Orchard architecture
☐ Irrigation
☐ Weather conditions

DURING THE TRIAL

Monitor:

☐ Fruit colour
☐ Fruit size development
☐ Fruit-surface temperature where practical
☐ Cracking
☐ Canopy condition
☐ Weather
☐ Rain / moisture events
☐ Film condition

AT HARVEST

Measure:

COLOUR

Compare fruit colour between:

- upper canopy,
- lower canopy,
- treated area,
- untreated control.

FRUIT SIZE

Record:

- diameter,
- fruit-size class,
- proportion above commercially important size thresholds.

SOLUBLE SOLIDS

Record:

°Brix / TSS

from treated and untreated fruit.

FIRMNESS

Measure fruit firmness using the same method in both areas.

CRACKING

Record:

- incidence,
- severity where practical,
- canopy position.

PEDICEL / STEM CONDITION

Record:

- green stem condition,
- dehydration,
- browning.

OTHER POST-HARVEST DEFECTS

Record where relevant:

- pitting,
- orange skin,

- decay,
- bruising,
- other commercial defects.

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9. POST-HARVEST ASSESSMENT IS ESSENTIAL

A reflective-film cherry trial should **not end at harvest**.

The Regina research demonstrates why.

Fruit can appear commercially acceptable at harvest while differences in post-harvest condition become evident later.

Where possible, evaluate fruit:

AT HARVEST

and again after:

STANDARD COMMERCIAL STORAGE / HANDLING

using the farm or packhouse's normal commercial procedure.

Record:

- firmness,
- stem/pedicel browning,
- cracking,
- pitting,
- skin condition,
- decay,
- marketability.

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10. LAPINS

WHAT RESEARCH TELLS US

The Regina study provides useful sweet-cherry evidence, but it does **not** establish a cultivar-specific application timing for Lapins.

AgriSun should therefore not automatically assign Lapins:

21 days

or

34 days

before harvest.

WHERE REFLECTIVE FILM MAY BE RELEVANT

Potentially where:

- lower or inner-canopy fruit colours poorly,
- plastic covers reduce canopy light,
- colour varies substantially between canopy positions,
- or fruit maturity is uneven through the canopy.

PUBLISHED TIMING

None that AgriSun should currently publish as a verified Lapins timing.

WHAT TO MEASURE

- skin colour,
- fruit diameter,
- Brix/TSS,
- firmness,
- cracking,
- pedicel condition,
- maturity,
- post-harvest defects,
- pack-out.

SOUTH AFRICAN TRIAL REQUIRED

YES — HIGH PRIORITY

A South African Lapins trial should establish:

- suitable timing,
- colour response,
- fruit-size response,
- cracking response,
- post-harvest condition,
- and performance under local cover systems.

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11. SWEETHEART

WHAT RESEARCH TELLS US

Sweetheart should not automatically inherit the Regina timing.

Cultivar differences in maturity, skin colour, canopy structure and cracking susceptibility mean that the treatment should be evaluated independently.

WHERE REFLECTIVE FILM MAY BE RELEVANT

Where growers experience:

- poor lower-canopy colour,
- uneven maturity,
- canopy shading,
- or reduced light beneath plastic covers.

PUBLISHED TIMING

No verified universal AgriSun timing.

WHAT TO MEASURE

- colour,
- fruit size,

- soluble solids,
- firmness,
- cracking,
- stem/pedicel condition,
- maturity,
- post-harvest quality,
- pack-out.

SOUTH AFRICAN TRIAL REQUIRED

YES

The trial should focus particularly on:

- timing,
- cracking,
- colour,
- maturity,
- post-harvest stem condition.

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12. SANTINA

WHAT RESEARCH TELLS US

The published Regina treatment provides useful background for sweet cherries generally, but it does not establish a Santina application programme.

Santina also differs in harvest timing and cultivar characteristics from Regina.

WHERE REFLECTIVE FILM MAY BE RELEVANT

Potentially where:

- colour development is uneven,
- fruit deeper in the canopy is lighter,
- protected cultivation reduces light,
- or the grower wants to improve canopy-light uniformity.

PUBLISHED TIMING

No verified universal Santina timing.

WHAT TO MEASURE

- colour,
- diameter,
- Brix,
- firmness,
- cracking,
- stems/pedicels,
- maturity,
- post-harvest defects.

SOUTH AFRICAN TRIAL REQUIRED

YES

Because Santina is earlier than Regina in many production systems, AgriSun should **not assume that Regina's 21- or 34-day programme is directly transferable**.

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13. SKEENA

WHAT RESEARCH TELLS US

No verified Skeena-specific reflective-film timing should currently be published by AgriSun.

WHERE REFLECTIVE FILM MAY BE RELEVANT

A trial may be worthwhile where:

- canopy shading affects colour,
- fruit colour differs substantially by canopy position,

- or protective covering reduces orchard light.

PUBLISHED TIMING

Cultivar-specific timing not established for AgriSun.

WHAT TO MEASURE

- colour,
- size,
- Brix,
- firmness,
- cracking,
- pedicel condition,
- maturity,
- post-harvest defects,
- commercial grade.

SOUTH AFRICAN TRIAL REQUIRED

YES

Trial timing and post-harvest condition should both be evaluated.

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14. BING

WHAT RESEARCH TELLS US

Bing is historically important in cherry research, but the Regina reflective-ground-film study should not be treated as evidence for a Bing-specific timing.

WHERE REFLECTIVE FILM MAY BE RELEVANT

Potentially in blocks where:

- colour development is uneven,
- lower-canopy fruit remains lighter,
- protective covers reduce light,
- or canopy architecture creates pronounced shading.

PUBLISHED TIMING

No verified universal Bing timing for the AgriSun programme.

WHAT TO MEASURE

- skin colour,
- fruit diameter,
- Brix,
- firmness,
- cracking,
- pedicel colour,
- maturity,
- storage condition,
- pack-out.

SOUTH AFRICAN TRIAL REQUIRED

YES

Local trial work should determine whether a short pre-harvest treatment is appropriate and whether fruit-condition trade-offs occur.

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15. QUICK CULTIVAR SUMMARY

Cultivar	Timing status
Regina	**21 and 34 days before harvest directly studied in southern Chile under plastic cover**
Lapins	South African cultivar-specific trial required
Sweetheart	South African cultivar-specific trial required

Cultivar	Timing status
Santina	South African cultivar-specific trial required
Skeena	South African cultivar-specific trial required
Bing	South African cultivar-specific trial required

16. WHAT EVERY AGRISUN CHERRY TRIAL SHOULD MEASURE

CORE MEASUREMENTS

COLOUR

Record:

- colour category,
- canopy position,
- treated vs control.

FRUIT SIZE

Measure:

- diameter,
- weight where appropriate,
- commercial size category.

SOLUBLE SOLIDS

Measure:

- °Brix / TSS.

FIRMNESS

Use the same method for treated and control samples.

CRACKING

Record:

- presence,
- incidence,
- canopy position,
- severity where practical.

STEM / PEDICEL CONDITION

Record:

- green colour,
- dehydration,
- browning,
- shrivelling.

POST-HARVEST QUALITY

Record:

- pitting,
- orange skin,
- cracking,
- stem condition,
- firmness,
- decay,
- overall marketability.

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17. CANOPY POSITION MATTERS

One particularly useful aspect of the Regina research was that researchers did not simply treat all fruit as one group.

They compared fruit from:

UPPER CANOPY

and

LOWER CANOPY.

That is important because reflective ground film is specifically intended to change the orchard light environment from below.

A South African AgriSun trial should therefore record canopy position wherever practical.

Otherwise, a response in lower-canopy fruit can be hidden when all fruit is averaged together.

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18. HOW TO SET UP THE TRIAL

Use at minimum:

AGRISUN TREATED AREA

Film installed according to the trial programme.

and

UNTREATED CONTROL

Comparable trees under the grower's normal management.

Ideally keep:

- cultivar,
- rootstock,
- tree age,
- crop load,
- cover,
- irrigation,
- pruning,
- and orchard management

as comparable as reasonably possible.

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19. SOUTH AFRICAN TRIAL PRIORITIES

PRIORITY 1 — REGINA

Objective

Validate the Chilean findings under South African conditions.

Compare:

21 days before harvest

against

34 days before harvest

and

untreated control

where the orchard structure allows.

Measure:

- colour,
- fruit size,
- Brix,
- firmness,
- cracking,
- pedicel condition,
- post-harvest quality.

This would give AgriSun a particularly strong local dataset because it directly tests an existing peer-reviewed treatment programme.

PRIORITY 2 — LAPINS

Establish:

- local timing,
- colour response,
- cracking,
- fruit size,
- post-harvest condition.

PRIORITY 3 — SANTINA

Because of its different harvest period, establish timing independently rather than transferring Regina's treatment.

PRIORITY 4 — SWEETHEART

Evaluate colour, maturity and post-harvest condition.

PRIORITY 5 — SKEENA / BING

Evaluate where commercially relevant to participating growers.

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20. WHAT AGRISUN SHOULD NOT CLAIM

Until South African cultivar-specific data exist, AgriSun should **not** claim that reflective ground film will:

- improve cherry colour in every cultivar,
- increase Brix in every orchard,
- increase fruit size,
- improve firmness,
- reduce cracking,
- improve stem condition,
- improve post-harvest quality,
- increase pack-out,
- or generate a particular financial return.

The Regina study itself demonstrates why.

Some variables improved.

Some defects increased.

That is precisely why results must be measured comprehensively rather than selecting only favourable outcomes.

21. SCIENTIFIC REFERENCE

Muñoz-Alarcón, A., Palacios-Peralta, C., González-Villagra, J., Carrasco-Catricura, N., Osorio, P. & Ribera-Fonseca, A. (2025).

Impact of Reflective Ground Film on Fruit Quality, Condition, and Post-Harvest of Sweet Cherry (Prunus avium L.) cv. Regina Cultivated Under Plastic Cover in Southern Chile.

Agronomy, 15(3), Article 520.

DOI: **10.3390/agronomy15030520**.

22. IMPORTANT USE NOTICE

The 21- and 34-day treatment periods presented in this guide were studied in **Regina sweet cherry grown under plastic cover in southern Chile**.

They should not automatically be interpreted as optimum timings for:

- another cultivar,
- another orchard architecture,
- another cover system,
- another climate,
- or another production region.

For Lapins, Sweetheart, Santina, Skeena and Bing, controlled local trials are required before AgriSun develops cultivar-specific timing guidance.

AGRISUN REFLECTIVE SOLUTIONS

Better Light. Applied With Evidence.

Published research gives us the starting point.

South African field trials allow us to determine what works under our cultivars, cover systems, climates and commercial handling conditions.