



Solution

# The Yield for Apples

## Benefits of the Yield for Apple Growers



Better apple thinning results at a lower cost



Better crop load management planning



Improve management of pest and disease with better spraying practice



Mitigate weather-related risk such as frost, heat stress and sunburn of fruit



Support move to data driven rather than experience-driven decision making



## Getting Better Apple Thinning Results at a Lower Cost

Crop load management is critical to the profitability of apple growers. Consistently hitting the fruit load target translates to the right size and quality fruit delivering better financial returns per acre.

Apple growers make multiple passes through the orchard as part of their thinning strategy. This includes passes for bloom thinning (spray), fruitlet thinning (spray) and green fruit thinning (manual labor). In organic apple orchards, fruitlet thinning is not an option, therefore bloom thinning becomes even more critical to get right.

More effective thinning earlier in the season reduces the need for green fruit thinning which translates to hundreds of dollars per acre in labor saving costs. It also can reduce the biennial bearing variance and waste from the tree using resources to grow fruit which is discarded.

"I'm using the Yield for Apples app to see if it's compatible for spraying today. If it isn't, I'm checking if it's ok for tomorrow. This year our thinning results were the best in 30 years. The accuracy of the weather forecasts has really helped with planning."

Orchard Manager



Researchers have developed high-quality models to guide thinning decisions (e.g., Pollen Tube model, Fruit Growth models). It will be essential that growers learn how to use the model in order to be ready for precision thinning sprays, as bloom can be highly variable. However, these models have historically been difficult to use and are not localized enough to the growing conditions of particular orchards. As a result, there is low use of the models in day-to-day thinning decisions.

The Yield's **On-Farm Playbook**, which is delivered to growing teams in the mobile app or Analytics Portal, is designed to make it easier to get effective thinning results for bloom and fruitlet thinning.

In Washington State, for example, we have worked with the Washington Tree Fruit Commission to create a playbook for apple industry which includes the Pollen Tube Growth model. We also have recommendations available for Metamitron and 6-Benzyladenine, which are widely used in the Australian and New Zealand apple industry. These products are very weather sensitive, and our recommendations make them easier to get best outcomes.

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**Our On-Farm Playbook makes it easy for field staff to enter observations for things like the start of bloom, flower counts and style lengths. This means our customers only need to enter data once and we take care of the rest including the complex calculations. We then deliver the in the app:**

- 01** The right time for applying thinning spray at the block or variety level hour-by-hour
- 02** Recommendations on the best spray windows considering localized weather

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Together this means better thinning results.



## Crop Load Management Planning

Consistently hitting commercial crop targets is hard. There are a complex set of interlinked plans and decisions. It requires getting the right teams and machinery in the right place at the right time using the right crop thinning products in the right weather conditions. A lot of things must come together to get the best result.

With our **Analytics Portal** we can take historical yield data (tonnage and size profile by variety), counts (either manual or scanned), thinning practice and overlay it with historical weather at customers' growing sites. This allows our customers to explore their data in the **Analytics Portal** for similar seasons in the past, what they did and what the outcomes they achieved. We speed up and make it easier for growers to learn because all the data is in one place.

Observations and counts after a thinning pass are part of a critical feedback loop. Traditionally, counts are often done manually. As a first step we are making it easier to record and use this important data, reducing double-handling and costs.

The future lies in cost-effectively automating the field observations process. A number of vendors are bringing products of this nature to market. Our Precision Yield Management Platform has been designed to be open. We already work with different vision systems vendors.

We are also working with Yamaha and its robotics portfolio companies to use field robots to automate collecting field data including observations and crop thinning spray data. When this R&D is completed, we will be able to close the feedback loop. This makes it easy to take action, evaluate the impact and adjust the thinning plan to get the right outcome.

As our customer build up data sets in our platform, we can deploy AI/ML models. Our yield prediction AI/ML models can give early indications of the yield allowing growers to adjust their thinning strategy for the upcoming season. We can also more accurately predict growth stages like the start of bloom, fruit set and harvest timing using AI models. These predictions are also important for off-farm planning such as storage, packing and sales.







## Improve Management of Pest and Disease and Mitigate Weather-related Risk such as Frost, Heat Stress and Sunburn of Fruit

Using our apple-specific **on-farm playbook**, field teams can access the best practices to achieve yield targets and mitigate risks such as weather events, pest, and disease. Our recommendations do all the complex calculations and adjust for local growing conditions. For example, using the combined disease risk, spray and ag-chem recommendations, orchard operators can adjust spray programs and dosage rates to get best outcomes at a lower cost.

Customers can choose recommendations they want to deploy from our crop templates or compile their own playbook from our available recommendations. Customers can adjust recommendation threshold to meet their requirements. Orchard teams only see recommendations relevant to the growth stage they are in.

For apples we have available a pre-configured crop template developed with the Washington Tree Fruit Commission as well as over 30 individual recommendations. This includes important models for apples such as Pollen Tube model, Codling Moth, Fireblight, Downy Mildew and Powdery Mildew.

We also support recommendations for weather-related risks such as frost, extreme heat, worker safety, and fruit sunburn.

Our platform can also deliver weather-related recommendations for thinning and crop protection products our customers use. For example, lime sulphur, Metamitron, 6-Benzyladenine, fungicides and plant growth regulators.

Our Precision Yield Management platform makes it quick and easy to add recommendations to our library which we are doing all the time.

All recommendations can be run using standard forecasts or hyper-local predictions with on-farm weather stations.

The **Analytics Portal** also allows operational teams to see recommendations and risks out 14 days.

With customer data uploaded in The Yield's precision yield management platform, your team can look at similar seasons in the past, risk profiles, what they did and what outcomes they achieved. This is particularly important when growing teams needs to adjust their plans for weather events. For example, if there has been a lot of wind at flowering, widespread frost, lower growing degree days after fruit set, high incidence of disease or risk of sunburn. Our Analytics Portal makes it quicker and faster for your teams to use data to speed up learning which translates to better yield outcomes.

Contact us to learn more.

Contact us

