2021

Collaboration Agreement

3-2-2021

1. EXECUTIVE SUMMARY

This non-binding agreement dated February 3rd, 2021 is set forth with the goal of setting the framework for a bi-lateral public-private partnership to enable the acceleration of innovations within the "Orchard of the Future" mission.

Public-private consortium between The Netherlands and Washington State (USA) to accelerate the adoption of innovative solutions for fruit orchards.

Whereas the parties to this agreement, including companies, universities and government representatives from both the United States and the Netherlands, have expressed the desire to work towards the goal of developing technology solutions for (tree) fruit orchards and taking the lead in the transition.

Whereas the goal of the collaborative program is to accelerate the adoption of innovative solutions in tree fruit orchards of the Western US, specifically Washington State. We do this by combining the innovative strengths of both Dutch & American agrobusiness ecosystems to establish new business models and solve the major challenges we are both facing in the areas of workforce scarcity, efficiency, environment, sustainability, and food safety.

2. INTRODUCTION

This Collaboration is part of a larger public private AgFoodTech Collaboration between Washington State, California and the Netherlands (**CAWADU**). This agreement is focussed on one of the five identified CaWaDu innovation themes: 'orchard of the future', aiming at orchard automation and robotization. To keep pace with increasing consumer and government demands regarding sustainability, environment and food safety in the fruit sector combined with the declining availability of workforce; intensified collaboration to speed up innovations and secure a sustainable future for the tree fruit sector is imperative.

Many people today still imagine a nostalgic picture when thinking of orchards, like having a family dinner in the shade of fruit trees full of delicious, ripe organically grown and locally harvested fruit. In contrast to this image fruit growers nowadays have grown into professional businesspeople facing more and more challenges in growing and harvesting their products. Combining and using both existing and new smart technologies available in both our ecosystems can help resolve these challenges.

Imagine for example thousands of acres or hectares of fruit orchards filled with trees equally shaped and orderly planted in rows to enable the business owner to grow and harvest large numbers of high-quality fruit in an efficient way. This automation process enables year-round availability of fruits for most of our increasing population. This collaboration contributes to the acceleration of these processes to collectively solve these challenges.

In order to profitably maintain their business in the future, fruit growers face the following challenges:

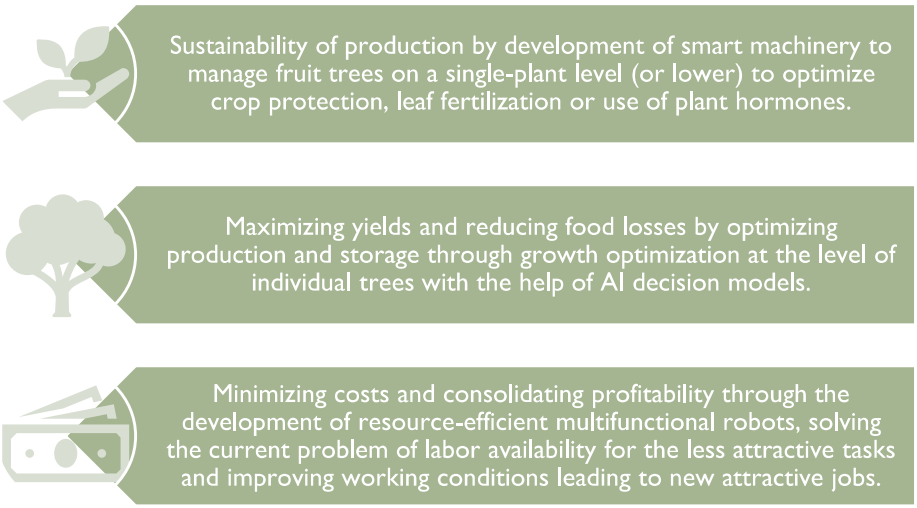
- A large labor force is needed to handle the picking and harvesting process. This labor force is increasingly hard to find. At the same time the rules for worker protection are getting stricter, so the use of current tools like ladders will become increasingly difficult,
- There is a growing concern regarding the effects of crop protection products on the environment and biodiversity. This has led to strict legislation specifying the use of crop protection products. This means that application of agrochemicals must continue to adapt,
- Natural resources such as water are becoming more scarce due to climate change,
- To ensure food safety, grocery stores and government bodies (e.g. FDA in the US and NVWA in the Netherlands) are increasingly demanding transparency and information on production methods and standards from the growers. At the same time consumer demands for clean and sustainably produced fruits are increasing. This requires growers to find innovative and sustainable production methods to address these societal shifts.

The demand for high quality and healthy fruit is growing, thanks to extra attention to the superior health preserving aspects of frequent fruit consumption and a growing population. At the same time fruits are more frequently used as a replacement to less healthy, and often highly processed snacks as well. To keep pace with this growing demand of high-quality fruit we must think of a totally different approach for growing, handling and securing our fruit supply chains.

3. OBJECTIVES & VISION

Making fruit cultivation more efficient, intelligent, sustainable, and future proof requires us to be able to monitor, manage, and make decisions at the level of individual trees. Smart Technology will enable getting the most out of an orchard through targeted, efficient use of crop protection agents, plant hormones and fertilizers, while saving on labor costs and minimizing food waste. This all contributes to the creation of a sustainable fruit cultivation system.

THE ORCHARD OF THE FUTURE COLLABORATION IS FOCUSED ON THREE OBJECTIVES:



THE FIRST SPECIFIC OUTCOMES BASED ON THE OBJECTIVES ARE ANTICIPATED AS FOLLOWS:

- A validated prototype precision sprayer for several fruit crops, which is directed at nozzle level based on smart algorithms and decision models and combined with stress, disease, and pest detection,
- A validated and functional prototype robot for pruning and harvesting,
- Validated sensors and algorithms to collect physiological and phyto-pathological characteristics of apple and pear,
- Validated decision models based on collected data and expert knowledge; targeted on production optimization, crop protection and storage,
- Data standards and protocols for data exchange,
- Economic validation and stimulation of adoption of the developed new technology.

OVERALL OBJECTIVES IN THE COLLABORATION:

- Connecting universities and other knowledge institutes in WA, California and The Netherlands for joint programs and setting up structural exchange programs for education and research collaborations,
- A strong connected Washington State and Netherlands Fruit sector & technology ecosystem,
- Build a strong business network of companies and growers on both sides,
- Create an innovative field lab network that can be used as local field labs and testing grounds for both sides, i.e. the experimental farm Proeftuin Randwijk in the Netherlands and the WSU Tree Fruit Research and Extension Center in Wenatchee,
- Creating access to public and private funding for the development and adoption of the necessary innovations with a strong focus on solid business models (ROI) for technology development companies and growers who need to invest in the solutions,
- Crafting government policies and aligning with relevant policy objectives through continued dialogue.

4. CONCLUSION

Innovation for tree fruit growers around orchard automation can be accelerated by working with the best agtech competences of both regions. This prevents redundancy, increases efficiency and accelerates the process of technology development and adoption. The best possible results can be achieved by creating a new model that integrates research, education & training, growth methods, production processes, distribution and sales, enabling sustainable and beneficial developments to all parties involved.

The scale and magnitude of such a program makes it necessary to develop a shared vision, ambition & proposition and to build a scalable business case with both Dutch and US public and private partners.

It is this combination of opportunity and strong partnerships that encourages the parties to enter into this collaboration agreement, taking the first step in creating a multilateral agtech development model in Washington, California and the Netherlands on fruit orchard innovations as a part the larger CaWaDu agtech collaboration.

WE ARE IN THIS TOGETHER:

- We all have a strong joint commitment to build a successful, profitable agtech business and research network in Washington State and proactively involve the relevant actors (researchers, growers, technology providers, local government bodies etc.) of our respective regions who are able and willing to contribute to our cause,
- We value each other's contribution, capabilities and complementarity and appreciate our differences in culture and character,
- We fully realize transparency and trust are essential to the success of our partnership,
- It is clear that each partner also has their own individual business interests (e.g. reputation, revenue's, network, knowledge) to pursue,
- We continuously aim to build a better partnership,
- We will communicate openly, honestly and intensively,
- We share the responsibility for all goals / objectives, deadlines, deliverables and budgets,
- We jointly resolve problems and risks.

IN WITNESS WHEREOF, the parties hereto have caused this non-binding, non-exclusive agreement to be executed on the date as first written above by their respective officers thereunto duly authorized.

5. PARTIES TO THE AGREEMENT

The Netherlands

Ministry of Agriculture, Nature and Food Quality
The Ministry wants to ensure good prospects for the Dutch farming, horticulture and fishing sectors, which are renowned worldwide for producing good-quality food that is safe and affordable. The Ministry is working with all stakeholders to restore and maintain natural areas. It aims to consolidate the agriculture sector's leading international position, strengthen the link between nature and agriculture, and improve farmers' economic situation.

By
Name: Guido Landheer,
Title: Assistant Vice Minister,
Ministry of Agriculture, Nature
and Food Quality

Signature
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FME
Association for the Technological Industry in the Netherlands

By
Name: Arjel Woudstra
Title: Director

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Arjel Woudstra
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NLWorks
Public-private network organization initiated by Dutch ministries of Economic Affairs, Foreign Affairs & the Confederation of Dutch business which operate as a broker for set-up of international consortia.

By
Name: Karin Bax
Title: Director

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Karin Bax
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Agromanager
Agromanager is a simple online platform that makes administration much easier from orchard to sorting.

By
Name: Laurens Tack
Title: CEO/Co-founder

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Laurens Tack
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Aurea Imaging

Aurea helps fruit growers by combining sensor technology with it's Crop Intelligence analytics to develop practical solutions for fruit thinning, growth regulation and crop protection.

By

Name: Bert de Rijk
Title: Chief Executive Officer

Signature

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Bert Rijk
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Bodata

Bodata is a company specialized in developing innovative hardware and software solutions for the fruit industry. Bodata has been installing and maintaining for more than 25 years the leading network of Mety weather stations in the Benelux and advises fruit growers on disease control with models for apple and pear scab, Cydia, Stemphylium, Neonectria and more, validating them in close cooperation with trend-setting Dutch and Belgium research institutes.

By

Name: Peter Boshuizen

Title: Director

Signature

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Delphy

Worldwide expertise of food & flowers

By

Name: René Bal

Title: Advisor Fruit

Signature

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René Bal
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Demcon

Demcon is a high-end technology supplier of products and systems.

By

Name: Dennis Schipper

Title: Chief Executive Officer

Signature

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p.p. Arno Stienen
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Fruitconsult

Fruitconsult is an independent private consultancy for fruit growing with mainly growers in Europe but also beyond

By

Name: Jan Peeters

Title: Owner

Signature

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Jan Peeters
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Hoogendoorn Growth Management

One of the world's foremost innovators in the horticulture sector with more than 50 years' experience in process automation.

By

Name: Pieter Kwakernaak

Title: General Manager
Hoogendoorn America inc.

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Pieter Kwakernaak
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Munckhof

Munckhof Fruit Tech Innovators is an equipment and systems manufacturer with more than 136 years of expertise and know how in development, design and supply of spraying and harvesting technology and logistic systems for fruit farming (since 1884), with data generation for precision farming.

By

Name: Henri Michiels

Title: Director Innovation

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Henri Michiels
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NFO (Dutch Fruit Growers Association)

The NFO supports the fruit growers in various areas such as increasing their knowledge and entrepreneurship. Important dossiers are: Socio-Economic issues, Market-related issues, Plant Protection, Knowledge transfer and Innovation.

By

Name: Siep Koning

Title: Director

Signature

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Siep Koning
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Qing

QING is an engineering company with strong focus on innovation within the Agri-, Food- and Packaging industry

By

Name: Bram de Vrught

Title: Business Manager

Signature

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Bram de Vrught
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Ridder

Ridder, a Dutch family-owned company, has been supporting growers and farmers for over 65 years with electromechanical systems, climate technology and software that is designed to optimize all cultivation and management processes within their controlled environment business.

By

Name: Joep van den Bosch

Title: Chief Innovation Officer

Signature

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Joep van den Bosch
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Stichting Wageningen Research, research institute Wageningen Plant Research

To explore the potential of nature to improve the quality of live

By

Name: Ernst van den Ende

Title: Managing Director

Signature

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Ernst van den Ende
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Washington State, United States of America

Washington State Department of Agriculture

The Washington State Department of Agriculture supports the viability and vitality of Washington agriculture through service, regulation, and advocacy, while protecting consumers, public health, and the environment.

By

Name: Derek Sandison

Title: Director

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Derek Sandison
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Washington Tree Fruit Research Commission

Our mission is to help find science-based solutions for the numerous challenges that face Washington apple, cherry, pear, and stone fruit growers and packers. To support research and extension efforts and Washington tree fruit sustainability, we collect and expend approximately $4.5 million annually from our growers assessments.

By

Name: Jim Doornink

Title: Board Chair

Signature

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Jim Doornink
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Davis Instruments

Davis Instruments created the personal weather station industry over 30 years ago. Today, Davis Instruments is a leading global provider of accurate, durable and affordable weather instruments and data services for homes, schools, government agencies and farms.

Signature

By

Name: Chris Sullivan

Title: President

Hectre

Hectre creates easy-to-use software that delivers real-time orchard activity, yield, and quality data to growers, whether they be small family-owned businesses or large scale enterprises. From harvest management, quality control, fruit sizing technology, pest control, workforce and task management, to payroll and data analysis, we make technology work for our customers, reducing time and product wastage, improving productivity and profitability.

Signature

By

Name: Matty Blomfield

Title: Chief Executive Officer

Innov8 Ag

Innov8.ag is partnered with Microsoft to enable growers to make informed on and off-farm management decisions based on machine learning and AI-based insights.

Signature

By

Name: Steve Mantle

Title: Founder & CEO

Oregon State University

Oregon State is an international public research university that draws people from all 50 states and more than 100 countries. We go wherever the challenges are, push ourselves to the very edge of what's known and keep going. We are determined to forge solutions. We are diverse and welcoming. We embrace our responsibility to Oregon and the world, building a future that's smarter, healthier, more prosperous and more just.

Signature

By

Name: Joe Davidson

Title: Assistent Professor of Robotics, OSU College of Engineering

Red Rooster Consulting

Red Rooster Consulting implements GPS and AutoCAD technology to provide the grower with a precise layout for their new orchard planting and a detailed bill of materials that they can submit to vendors for competitive bids.

By:

Name: Scott Jacky

Title: Owner

Signature

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Scott Jacky
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UC Agriculture and Natural Resources (UCANR)

True to the mission of the land grant universities, UC Agriculture and Natural Resources connects the power of UC research in agriculture, natural resources, nutrition and youth development with local communities to improve the lives of all Californians.

By

Name: Gabe Youtsey

Title: Chief Innovation Officer

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WSU College of Agriculture, Human and Natural Resource Sciences (CAHNRS),

Washington State University is a public research-intensive university committed to its land-grant heritage and tradition of service to society.

Name: André-Denis, G. Wright

Title: Dean

- David J. Brown, Director, AgWeatherNet
- Manoj Karkee, Associate Professor, Dept. of Biological Systems Engineering, Center for Precision and Automated Agricultural Systems
- WSU Tree Fruit Extension Team
- Irrigated Agriculture Research and Extension Center, Prosser
- Tree Fruit Research and Extension Center, Wenatchee

By

Name: André-Denis, G. Wright

Title: Dean

Signature

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André-Denis Wright
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Automated AG Systems

Automated Ag is an agricultural equipment manufacturing company in Moses Lake, WA. It is focused on the design and construction of innovative harvesting and harvest transport systems.

Name: J.J. Dagoret
Title: Owner

Signature

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J. J. Dagoret
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