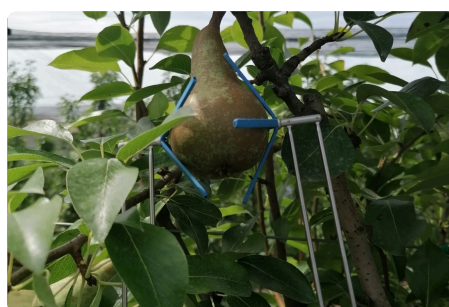




FINAL NEWSLETTER • OCTOBER 2026

FruitCREWS Legacy Interviews

An editorial review of four years of the Action, followed by interviews with the Chair, the Vice-Chair, the Working Group leaders, the Grant Awarding Coordinator and the Science Communication Coordinator of COST Action FruitCREWS.



Photos: the FruitCREWS community in Brussels, at the first annual meeting in Italy and in Greece, and sensors and irrigation technologies demonstrated in the field.

IN THIS ISSUE

Editorial review FruitCREWS Core Group	2	WG3 Martin Mészáros	12
Chair Brunella Morandi	4	WG4 Alon Ben-Gal	14
Vice-Chair Virginia Hernández-Santana	6	WG5 Diego Intrigliolo	16
WG1 Pasquale Losciale	8	Grant Awarding Coordinator George Manganaris	18
WG2 Kathy Steppe	10	Science Communication Vladimir Mrkajić	20





EDITORIAL REVIEW

Four years of FruitCREWS: from the tree to European policy

FruitCREWS Core Group

When FruitCREWS started in October 2022, its goal was easy to state and hard to achieve: to help fruit growers irrigate more efficiently and secure the future of orchards under water scarcity, by better understanding how trees respond to drought and by improving the decision support systems (DSSs) used for irrigation scheduling. As the Action comes to its formal end on 16 October 2026, this review looks back at what the network has achieved, drawing on the work of the Working Groups and on the reflections of the Core Group members interviewed for this newsletter.

An open, international community

FruitCREWS grew into an open network of more than 350 participants from 43 countries on five continents. The annual meetings in Bertinoro (2023), Seville (2024) and Naoussa (2025) and the final event in Brussels (2026) were the places where this community met, discussed and planned joint work. The Naoussa meeting alone gathered around 120 participants, with 6 keynote talks, 33 oral presentations and 24 posters. Partners from Israel, Turkey, Tunisia, North America, Africa and Australia gave the network a global dimension, bringing perspectives from regions that have managed water scarcity for decades.

Scientific outputs: a chain from tree to practice

The five Working Groups were organised as a chain, from understanding the tree to putting knowledge into practice.

WG1, Physiological parameters and sensing (Pasquale Losciale), compiled 88 irrigation trial case studies, coordinated a Special Issue in *Scientia Horticulturae* on plant-based and remote sensing for irrigation, and prepared crop-specific reviews for almond, olive, grapevine, peach, apple and kiwifruit. Its “toolbox” approach matches the best indices and sensors to each species, cultivar and situation.

WG2, Models (Kathy Steppe), mapped existing modelling approaches and showed how plant sensors and mechanistic models can complement each other. One clear finding is that few plant-based models are yet available for irrigation scheduling, and most of them need physiological inputs.

WG3, Irrigation scheduling (Martin Mészáros), reviewed scheduling protocols for crops from apples and pears to olives and grapevines, and contributed to joint review papers, for example on olive water productivity and on strawberry evapotranspiration. Strategies such as subsurface drip and regulated deficit irrigation proved very promising, often saving water without yield or quality losses, provided reliable thresholds are defined.

WG4, DSSs: advantages and constraints (Alon Ben-Gal), screened more than 30 irrigation DSSs and ran a pan-European survey of growers. The survey identified four distinct farmer profiles and showed that adoption depends mainly on behavioural factors, such as motivations and perceived risks, so digital transformation in agriculture must be treated as a socio-technical process.

WG5, Implementation into practice (Diego Intrigliolo), brought these results together into research and policy priorities, published as the FruitCREWS Position Paper and as an Editorial in *Scientia Horticulturae*.



Training and mobility

Training schools gave early-career researchers hands-on experience, starting with the school on plant sensors and modelling in Ghent in May 2024 and continuing in 2026 with training schools on fertigation in the Netherlands and on irrigation management using DSSs. The e-seminar series, coordinated by Vice-Chair Virginia Hernández-Santana, connected researchers and practitioners online, with up to 50 participants per session. More than 30 Short-Term Scientific Missions and other mobility grants were awarded, and all available funding was used in each of the four Grant Periods. Most beneficiaries were early-career researchers, many of them from Inclusiveness Target Countries, and several missions linked practice and research, such as the STSM of an independent berry expert at the Cyprus University of Technology.



Orchard field visit, July 2023.

Stakeholder engagement and policy dialogue

From the start, FruitCREWS worked with growers, companies and public authorities. Sensor and DSS companies presented their tools at the first annual meeting, field visits took participants to farms such as the La Hampa experimental farm in Seville and a pear orchard in Bierbeek, and a FruitCREWS workshop was held at Fruit Logistica in Berlin in February 2026.

In its final stage, the Action brought its results into the policy arena. On 24 June 2026, the final workshop at the European Parliament Info Hub in Brussels gathered researchers, representatives of DG AGRI, Members of the European Parliament from the AGRI and ENVI

committees, and stakeholder organisations including AREFHL, Copa-Cogeca, Irrigants d'Europe and the European Irrigation Association. The conclusions of this dialogue were built into the FruitCREWS Position Paper, which identifies three research and innovation priorities (enhancing crop resilience to water-related stresses, accelerating the deployment of precision water management, and scaling impacts from farm to basin level) together with the enabling conditions that stakeholders consider essential. In September, WG5 leader Diego Intrigliolo carried these messages to the EU AgRI 2040 Conference, where DG AGRI discussed priorities for the next generation of EU agricultural research and innovation. Press releases, newsletters, the website and the Action's social media channels supported this work throughout the four years.



Sensors and irrigation technologies demonstrated in the field, July 2023.

What remains

Asked what will remain of FruitCREWS in five years, the Core Group members gave very similar answers: the community. As Vice-Chair Virginia Hernández-Santana put it, "My main lesson is that people are the real success factor of a COST Action." Partners are already preparing new Horizon Europe proposals, joint publications and further cooperation. WG2 leader Kathy Steppe summed it up: "In this sense, FruitCREWS should not be seen as the end of a successful COST Action, but as the starting point for new collaborations that will turn scientific knowledge into practical solutions for a more water-resilient future."

Thank you to everyone who made these four years possible.



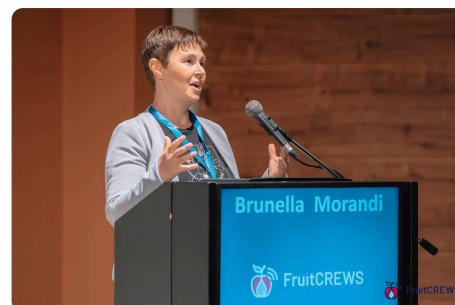


LEGACY INTERVIEW • ACTION CHAIR

“What exceeded my expectations was the human side of the Action.”

Brunella Morandi · Chair of the COST Action FruitCREWS

As FruitCREWS comes to a close, we asked Working Group leaders and Core Group members to look back at four years of the Action. Our Chair, Brunella Morandi, talks about the final workshop at the European Parliament, the young researchers who grew with the network, and why the EUFRIN Working Group on Water Relations and Irrigation is the natural home for what comes next.



Brunella Morandi speaking at the FruitCREWS meeting in Naoussa, Greece.

ABOUT THE ACTION AND YOU

1 What was your main role in FruitCREWS, and which achievement are you most proud of?

As Chair of FruitCREWS, I have coordinated the Action's scientific and networking activities, liaised with the COST Association and worked with the Core Group to keep our programme on track. An equally important part of my role has been to encourage new initiatives and to share with colleagues the enthusiasm that makes a network productive. I am most grateful for the support received from the Core Group and all other colleagues, and proud of the community we have built across disciplines and countries, connecting research on fruit tree water relations with the practical needs of growers and technology providers.

“

Orchards are long-term investments, and their capacity to adapt to water scarcity and heat has implications that extend across growing seasons.

2 What is your most memorable moment from the four years of the Action?

For me, it was our final workshop at the European Parliament Info Hub in Brussels on 24 June 2026. After almost four years of collaboration, we brought our findings and recommendations into a discussion with policymakers and representatives of the fruit and irrigation sectors. It was particularly meaningful to see our community contribute to a debate about how Europe can respond to water scarcity and heat waves while sustaining agricultural production. The discussion made clear that progress depends on helping growers put scientific knowledge and available technologies into practice, with the advisory support and policies needed to make adoption possible.

3 IN ONE SENTENCE: WHAT WILL REMAIN OF FRUITCREWS IN FIVE YEARS' TIME?

“I hope FruitCREWS will leave a lasting international community that continues to develop and share solutions for resilient fruit production and sustainable water use, working closely with growers, industry and policymakers, with many friendships that endure well beyond the Action.”



4 When FruitCREWS started in October 2022, what did you hope it would achieve? What turned out better than expected, and what turned out differently?

When we started, I hoped we would bring together the knowledge needed to connect fruit tree physiology with better irrigation decisions. We had ambitious plans to identify useful indicators of water stress, compare models and irrigation strategies, and clarify how this knowledge could improve decision support systems for growers. As our discussions developed, we became increasingly aware of how much responses vary between crops, environments and stages of development. Translating that complexity into reliable recommendations was more demanding than we had anticipated. The network gave us a valuable opportunity to compare evidence, identify gaps and develop questions for future collaborative research.

What exceeded my expectations was the human side of the Action. I initially imagined its legacy mainly in terms of scientific outputs. I now see how much those outputs depend on people getting to know one another, sharing ideas openly and developing the trust needed to work together. The collaborations and friendships that grew through FruitCREWS give me confidence that this work will continue.

“

I believe we have helped prepare a new generation of scientists to lead research on fruit tree water relations and irrigation.

5 In your view, what did FruitCREWS make possible that a single research project could not have done?

FruitCREWS gave us a breadth and continuity of exchange that would have been difficult to achieve within a single



Session 1 of the final workshop at the European Parliament Info Hub in Brussels, 24 June 2026.

research project. I was especially impressed by the contribution of young researchers. They helped shape reviews and surveys, took part in training schools and workshops, and visited other laboratories through Short-Term Scientific Missions. Seeing them take responsibility and develop their own collaborations has been one of the most rewarding aspects of chairing the Action. I believe we have helped prepare a new generation of scientists to lead research on fruit tree water relations and irrigation.

6 The Action formally ends on 16 October 2026. How will the FruitCREWS community stay active, and what would you like it to achieve in the next three to five years?

FruitCREWS grew out of the Water Relations and Irrigation Working Group of EUFRIN, the European Fruit Research Institutes Network. I see that group as a natural home for continuing our exchanges, while maintaining the wider international connections developed through the Action. Joint publications and new research proposals can help us sustain that momentum.

Over the next three to five years, I would like us to strengthen our dialogue with European policymakers and make the needs of perennial crops more visible in discussions about water resilience. Orchards are long-term investments, and their capacity to adapt to water scarcity and heat has implications that extend across growing seasons. I would like our community to advance research on plant responses and irrigation tools while working more closely with growers, advisers and technology providers to support their practical use. For me, success would mean that the relationships built through FruitCREWS lead to coordinated research and policies that help fruit growers adapt.



Innovative technology showcase workshop at the first annual meeting in Italy.





LEGACY INTERVIEW • ACTION VICE-CHAIR

“People are the real success factor of a COST Action”

Virginia Hernández-Santana · Vice-Chair of the COST Action FruitCREWS

As FruitCREWS comes to a close, we asked Working Group leaders and Core Group members to look back at four years of the Action. Virginia Hernández-Santana talks about friendships built through science, bringing research to policy makers in Brussels, and why a COST Action should invest in an inclusive community from day one.



The FruitCREWS session at the final workshop in Brussels, June 2026.

ABOUT THE ACTION AND YOU

1 What was your main role in FruitCREWS, and which achievement are you most proud of?

As Vice-Chair of FruitCREWS, I worked closely with the Chair and Working Group leaders to help coordinate the Action and strengthen collaboration across our growing community. I contributed to communication, training and networking activities, including coordinating the FruitCREWS e-seminar series, participating in Training Schools and hosting several researchers through STSMs. What makes me most proud is having helped create a network in which scientific collaboration naturally evolved into meaningful professional relationships and friendships, generating opportunities that will continue long after the Action has ended.

2 What is your most memorable moment from the four years of the Action?

It is difficult to choose a single moment because FruitCREWS offered many memorable experiences. What I

think I will remember most are the extraordinary relationships I built with remarkable scientists whom I had admired long before joining the Action and from whom I learned so much, as well as with many promising young researchers. I also think this is the closest I have come in my professional career to seeing my research make a real impact on European society, through discussions with policy-makers in Brussels on behalf of a community of more than 350 people sharing a common objective: producing fruit more sustainably from a water-use perspective. It has been especially rewarding to see our work contribute not only to scientific publications, but also to policy recommendations through the FruitCREWS Position Paper, which is currently being finalized. Hosting the annual meeting in Seville and welcoming colleagues to the La Hampa experimental farm was also very special. I greatly enjoyed hosting students, postdocs and senior researchers at IRNAS-CSIC through STSMs. Seeing people learn from one another and create lasting collaborations has been one of the most rewarding aspects of FruitCREWS.

3 IN ONE SENTENCE: WHAT WILL REMAIN OF FRUITCREWS IN FIVE YEARS' TIME?

“The lasting legacy of FruitCREWS will be a strong international community united by a common objective: translating scientific knowledge into practical solutions for more resilient and sustainable fruit production.”



4 You hosted the second annual meeting in Seville, including the visit to the La Hampa experimental farm. What role did living labs and field visits play in connecting research with growers?

Living labs and field visits are among the most effective ways of bridging the gap between research and practice. During our visit to La Hampa, participants could move beyond presentations and discussions and observe first-hand the challenges associated with managing fruit orchards under increasing water scarcity. These exchanges help ensure that research remains relevant to growers' needs while giving producers direct access to the latest scientific developments and technological innovations.

5 Looking at the whole Action, which result do you think will be most useful for growers?

Looking at the whole Action, I believe one of the most valuable outcomes for growers is the body of knowledge generated on how to assess tree water status and use that information to make more informed irrigation decisions. By bringing together expertise in plant physiology, sensing technologies, modelling and decision-support systems, FruitCREWS has helped move us closer to irrigation strategies that are both scientifically robust and feasible under real farming conditions. At the same time, through a pan-European survey, we were able to identify and quantify the main barriers that still limit the adoption of these tools by growers. What I find especially valuable is that we did not stop at identifying these challenges. We brought this evidence to discussions with policy-makers and stakeholders in Brussels, communicated it through scientific publications, and

incorporated it into the policy-oriented FruitCREWS Position Paper. In my view, helping create the conditions that facilitate the adoption of existing knowledge and technologies may ultimately have the greatest impact on growers.

6 As Vice-Chair, what did you learn about running a large international network that you would share with someone starting a new COST Action?

My main lesson is that people are the real success factor of a COST Action. Scientific objectives are important, but they are only achieved when participants feel engaged, welcomed and valued. Activities such as annual meetings, Training Schools and STSMs created opportunities for researchers at different career stages to interact, learn and collaborate. What I enjoyed most was seeing young researchers gain confidence, develop international collaborations and build friendships across countries and disciplines. Watching these connections grow over the four years of the Action has been incredibly rewarding. I would encourage anyone starting a new COST Action to invest time in building an inclusive community from day one, because the strongest and most enduring outcomes often emerge from the relationships between people rather than from individual projects alone.

“

This is the closest I have come in my professional career to seeing my research make a real impact on European society.



A field visit during the annual meeting in Seville.



With young researchers during a FruitCREWS excursion.



FruitCREWS participants at the annual meeting in Seville.



LEGACY INTERVIEW • WORKING GROUP 1

“By bringing together our experience, we realised how resilient trees are”

Pasquale Losciale • Leader of Working Group 1, “Physiological parameters and sensing technologies”

As FruitCREWS comes to a close, we asked Working Group leaders and Core Group members to look back at four years of the Action. Pasquale Losciale talks about the “toolbox” approach to plant-based indices and sensors, a rainy first meeting in Naoussa, and why we should learn from the trees themselves.



Pasquale Losciale in the field.

“

The challenge is to understand their language through ecophysiology and to decode their messages by means of plant-based indices and sensors.

ABOUT THE ACTION AND YOU

1 What was your main role in FruitCREWS, and which achievement are you most proud of?

As leader of Working Group 1 (Physiological parameters and sensing technologies), I was at the starting point of the Action's work. Together with all the task leaders (Joaquim Bellvert, Melissa Venturi and Konni Biegert), I tried to start a fruitful discussion among the WG1 participants (around 300) about the possible difference between tree water status and tree functionality. By bringing together our experience, we realised how resilient trees are, managing water scarcity with different strategies. The challenge is to understand their language through ecophysiology and to decode their messages by means of plant-based indices and sensors.

I am proud that, together with our community, we started a science-based overview of the best indices and sensors to use for each species or cultivar and situation, following the “toolbox” approach.

2 What is your most memorable moment from the four years of the Action?

FruitCREWS was full of memorable moments, but two stand out: the first Core Group meeting in a rainy Naoussa, in front of a fireplace, where we started to plan how the Action would be carried out; and the annual meetings, which gave me the opportunity to learn a lot, above all from companies and young researchers.

3 IN ONE SENTENCE: WHAT WILL REMAIN OF FRUITCREWS IN FIVE YEARS' TIME?

“The strong collaboration among the participants and the contagious enthusiasm of our young colleagues.”

4 WG1 compiled 88 irrigation trial case studies, launched a Special Issue in Scientia Horticulturae and prepared crop-specific reviews. Which of these outputs will be most useful in the coming years?

I cannot choose one, as I think they are all important. While the reviews and the Special Issue allowed us to consolidate current knowledge, the trial case studies give us the opportunity to carry out complex studies: finding conserved strategies across species and the related indices and sensors to use, or finding different plant behaviour according to species, pedoclimate and management.

5 Which sensing approach is closest to being used routinely by growers, and what is still holding it back?

Again, I need to recall the “toolbox” approach: it will depend on the species and the situation. Of course, according to researchers, stomatal conductance and photosynthesis are the most reliable indicators, but today measuring them is complex and time-consuming.

On the other hand, thermal imaging seemed promising but is not always reliable. The challenge is to find an indirect way to estimate the most reliable indicators using other sensors or models (which is the topic of WG2), and for me this is an amazing challenge.

6 The Position Paper calls for more research on how trees adapt to drought, salinity and heat waves. Which open questions would you put at the top of the research agenda?

I believe it is of fundamental importance to study the resilience strategies trees use to manage water scarcity, in order to learn from them and to develop agricultural practices accordingly.

“

...to find an indirect way to estimate the most reliable indicators using other sensors or models, and for me this is an amazing challenge.



The first Core Group meeting in Naoussa, in front of the fireplace.



Inspecting an irrigation system during a rainy field visit.



In front of the Faculty of Agriculture, University of Bari Aldo Moro.





LEGACY INTERVIEW • WORKING GROUP 2

“FruitCREWS should not be seen as the end of a successful COST Action, but as the starting point for new collaborations”

Kathy Steppe • Leader of Working Group 2, “Models”

As FruitCREWS comes to a close, we asked Working Group leaders and Core Group members to look back at four years of the Action. Kathy Steppe talks about bringing plant sensors and mechanistic models together, the training school in Ghent, and what Europe still needs to turn its knowledge into tools for growers.



Kathy Steppe at the FruitCREWS training school in Ghent.

ABOUT THE ACTION AND YOU

1 What was your main role in FruitCREWS, and which achievement are you most proud of?

As leader of Working Group 2 (WG2), my main role was to bring together researchers working on different modelling approaches and to explore how models, particularly mechanistic plant models, could be integrated with plant-based sensing technologies to improve irrigation scheduling and decision support. I am particularly proud of the training school we organised in Ghent in May 2024, where we brought together an enthusiastic international community of researchers eager to explore the potential of plant sensors and modelling. Another important achievement was mapping the diversity of existing modelling approaches and identifying their strengths, limitations and knowledge gaps. These insights provide a valuable foundation for future research and,

hopefully, the next generation of irrigation decision support tools.

2 What is your most memorable moment from the four years of the Action?

It is difficult to choose just one! I particularly remember our lively brainstorming sessions in Naoussa, where we exchanged ideas and discovered new opportunities for collaboration. The discussions with the core group, often continuing over lunch, were equally memorable and reflected the wonderful atmosphere within FruitCREWS. Another highlight was our visit to the European Parliament in Brussels, where we had the opportunity to bring our scientific insights into discussions on future European water management. But perhaps most importantly, I will remember the people, the friendships and even the little things, such as introducing the term ‘Wu-G’ for Working Group!

3 IN ONE SENTENCE: WHAT WILL REMAIN OF FRUITCREWS IN FIVE YEARS’ TIME?

“A strong and lasting international community of researchers and experts who know and trust each other, combine their complementary expertise, and continue working together towards integrated, science-based solutions for climate-resilient fruit production and sustainable water management.”



4 WG2 worked on bringing mechanistic models and plant-based sensing closer to irrigation practice. What progress did the network make, and what is still missing?

One important achievement was recognising the diversity of modelling approaches and demonstrating how plant sensors and models can complement each other to improve our understanding of fruit tree water relations and support irrigation decisions. I strongly believe that the next generation of irrigation scheduling tools could benefit from integrating plant-based measurements with mechanistic models, allowing us to derive meaningful hydraulic parameters that reflect how trees respond to changing environmental conditions. At the same time, it was striking to see how strongly current irrigation practices still rely on traditional FAO-based approaches. A considerable gap remains between our physiological understanding of plant water relations and its practical implementation. FruitCREWS helped us identify this gap more clearly and brought together the expertise needed to start bridging it.

“

...and even the little things, such as introducing the term ‘Wu-G’ for Working Group!

5 How did FruitCREWS shape the next generation of researchers in this field?

I believe one of the greatest strengths of FruitCREWS was its investment in young researchers. During the training school in Ghent, we offered participants hands-on experience with plant sensors and showed how mechanistic models can help translate sensor measurements into a deeper understanding of plant functioning. Rather than simply collecting data, we encouraged participants to explore the underlying



Participants of the training school on plant sensors and modelling in Ghent.

physiological processes and discover how these insights could contribute to smarter irrigation strategies. I hope we inspired them to think beyond existing approaches and develop the next generation of applications. WG2 also played an important connecting role between the physiological knowledge and sensing technologies of WG1 and the more applied irrigation strategies and decision support systems developed by the other Working Groups. This integration of expertise, together with the personal connections established during FruitCREWS, will be invaluable for the next generation of researchers.

6 How does European research on plant water relations, sensing and modelling compare with other regions? Where does Europe lead, and where does it need to catch up?

This is a challenging question, as excellent research and innovative applications are being developed across the world. Rather than identifying one region as the leader, I believe Europe's particular strength lies in its ability to bring together complementary expertise across countries, disciplines and research communities. FruitCREWS has been an excellent example of this. By connecting plant physiology, sensing technologies, modelling and practical irrigation management, we have helped pave the way towards more integrated approaches to sustainable water use. However, we still need to accelerate the translation of scientific knowledge into practical, accessible tools for growers. Our discussions at the European Parliament highlighted how important it is to connect research, innovation and policy. Europe has the knowledge and the networks. The next challenge is turning these strengths into solutions that make a real difference in the field.

In this sense, FruitCREWS should not be seen as the end of a successful COST Action, but as the starting point for new collaborations that will turn scientific knowledge into practical solutions for a more water-resilient future.



Core Group meeting in Berlin.





LEGACY INTERVIEW • WORKING GROUP 3

“Growers who want to irrigate their crops more precisely need to focus on improving water productivity in their orchards.”

Martin Mészáros · Leader of Working Group 3, “Irrigation scheduling”

As FruitCREWS comes to a close, we asked Working Group leaders and Core Group members to look back at four years of the Action. Martin Mészáros talks about the review work of WG3, how climate change is changing irrigation in Central Europe, and what the region can learn from the south.



Study visit during the Core Group meeting in Naoussa.

ABOUT THE ACTION AND YOU

1 What was your main role in FruitCREWS, and which achievement are you most proud of?

As leader of Working Group 3, I was responsible for directing our efforts to review current knowledge on irrigation management practices and suitable irrigation strategies, in order to promote solutions leading to sustainable water management and improved water productivity in the irrigation of different fruit crops. I am most proud of having taken part in building the FruitCREWS community, which connects scientists, stakeholders and growers, actively collects and reviews current knowledge, and bridges the gap between research and the practical use of new technologies.

2 What is your most memorable moment from the four years of the Action?

FruitCREWS was built on many memorable moments, thanks to its great community. I personally enjoyed all the international events and meetings, especially the annual

meetings in Bertinoro (Italy), Seville (Spain) and Naoussa (Greece), as well as the key meeting at the European Parliament in Brussels (Belgium), getting to know new people and places from around the world. I will always remember my experience at the XI International Symposium on Irrigation of Horticultural Crops, hosted by Alessio Scalisi in Tatura, Australia. As a young Working Group leader, it was a valuable experience for me to work with a group of very interesting people, experts in water management and irrigation of fruit crops. We succeeded in preparing a number of review papers, for example one on olive water productivity (coordinated by Anabela Fernandes-Silva, University of Trás-os-Montes e Alto Douro, Portugal) and one on crop evapotranspiration of strawberries (coordinated by Nataša Čereković, University of Banja Luka, Bosnia and Herzegovina). We organized several workshops and shared our knowledge at many international conferences. I think we came closer to the solutions for irrigating fruit crops in the future.

3 IN ONE SENTENCE: WHAT WILL REMAIN OF FRUITCREWS IN FIVE YEARS' TIME?

“The FruitCREWS community has grown into a family in which people from all around the world are united by their efforts to build a better future for sustainable fruit growing. This legacy will continue in our future collaboration, as this is not the end, but just the beginning of a great journey.”



4 WG3 reviewed irrigation scheduling protocols for many fruit crops, from apples and pears to olives and grapevines. What is the main lesson for growers who want to irrigate more precisely?

Growers who want to irrigate their crops more precisely need to focus on improving water productivity in their orchards. There is no single best solution. Growers need to adapt their decisions and orchard management practices to the crop water requirements, the specific soil and climate conditions of the area and, at the same time, to local water availability. Quantifying the right amount of water for irrigating fruit trees according to the physiological needs of the plant leads to the most precise solutions. Still, further research is needed to fully understand the interactions between plant water relations and actual water requirements in fruit orchards and vineyards.

“

As a young Working Group leader, it was a valuable experience for me to work with a group of very interesting people, experts in water management and irrigation of fruit crops.

5 In Central Europe, irrigation of orchards used to be less of a concern than in the Mediterranean. How is climate change changing this, and what can growers learn from southern Europe?

Growers in the Czech Republic, but also in other Central European countries, were historically used to providing fruit orchards with only supplementary irrigation in regions with a semi-humid to semi-dry climate. Many orchards were planted in areas without direct access to



At the annual meeting in Seville.

water resources, because rainfall during the growing season was sufficient. With climate change, extreme droughts are becoming more frequent and more intense, and many growers face new problems that cannot be solved without systematic adaptation. In these countries, we need to focus more on preserving sufficient water resources, extending irrigation infrastructure and adopting new technologies and strategies for irrigation scheduling, to secure a sustainable improvement in the water productivity of fruit orchards. Even if it first needs to be adapted to local conditions, there is a lot of knowledge and experience we can learn from southern Europe to improve the use and value of the available water.

6 FruitCREWS brought together countries with very different irrigation traditions. What did researchers from Central and Eastern Europe gain from the network, and what did they bring to it?

In general, most of the breakthrough irrigation technologies and strategies were developed in countries that have coped with drought since time immemorial, because of their long-standing needs. This is the basis on which researchers from Central and Eastern Europe build, extending knowledge about plant water relations and adapting new technologies to local climatic conditions and plant water needs.

“

With climate change, extreme droughts are becoming more frequent and more intense, and many growers face new problems that cannot be solved without systematic adaptation.



At the FruitCREWS training school in Ghent.





LEGACY INTERVIEW • WORKING GROUP 4

“Digital transformation in agriculture must be treated as a socio-technical process, not just a technological upgrade”

Alon Ben-Gal • Leader of Working Group 4, “Decision Support Systems: Advantages and Constraints”

As FruitCREWS comes to a close, we asked Working Group leaders and Core Group members to look back at four years of the Action. Alon Ben-Gal talks about the pan-European grower survey, the rising stars of WG4, and what Europe and Israel can learn from each other.



Alon Ben-Gal speaking at the Fruit Logistica Science Symposium.

ABOUT THE ACTION AND YOU

1 What was your main role in FruitCREWS, and which achievement are you most proud of?

As leader of Working Group 4 (“Decision Support Systems: Advantages and Constraints”), I directed our efforts in assessing the reliability and real-world usefulness of decision support tools for fruit tree irrigation. I am most proud of bringing our community together to conduct an extensive pan-European survey of growers to understand what truly drives or hinders the adoption of these tools. The survey’s revealing insights will directly inform public policy, future research, and private-sector strategies.

“

Seeing their impact makes me tremendously optimistic about the future of fruit tree irrigation research.

2 What is your most memorable moment from the four years of the Action?

FruitCREWS was filled with memorable moments thanks to its fantastic community, but as a senior researcher, I particularly enjoyed collaborating with our outstanding early-career scientists. Two highlights stand out: first, co-authoring a review manuscript on olive water productivity coordinated by Anabela Fernandes-Silva (University of Trás-os-Montes e Alto Douro, Portugal) and Omar Garcia-Tejera (Universidad de La Laguna, Spain), where identifying knowledge gaps and future needs together was a genuinely rewarding process. Second, WG4’s success relied heavily on the incredible drive, input, and leadership of two rising stars: Maria del Mar Borrego-Marin (University of Seville, Spain) and Alexandra Boini (University of Bologna, Italy). Seeing their impact makes me tremendously optimistic about the future of fruit tree irrigation research.

3 IN ONE SENTENCE: WHAT WILL REMAIN OF FRUITCREWS IN FIVE YEARS’ TIME?

“The lasting legacy of FruitCREWS will be the strong, collaborative community we built and the ongoing achievements of its members – especially our early- and mid-career researchers.”



4 WG4 reviewed more than 30 irrigation decision support tools and surveyed growers in many countries. What is the most important lesson about why growers use, or do not use, these tools?

While irrigation Decision Support Systems (DSS) offer huge potential for water productivity and sustainability, their adoption remains limited by technical, economic, and contextual barriers. Our survey revealed that adoption patterns across countries and crops are driven primarily by behavioral factors such as farmer motivations and perceived risks, rather than structural characteristics alone. By identifying distinct behavioral profiles, we showed that digital transformation in agriculture must be treated as a socio-technical process, not just a technological upgrade. Moving forward, effective policies, extension strategies, and support mechanisms must account for this diversity to foster meaningful, sustained adoption.

“

Europe currently leads in model- and sensor-based plant water physiology understanding.

5 Israel has managed severe water scarcity for decades. What can Europe learn from that experience, and is there anything Europe does better?

Israel's success stems from a unique package: extreme water scarcity, a high-tech economy, centralized water

management, and highly adaptive farmers willing to invest in innovation. Israel led two major breakthroughs: high-efficiency distribution systems (pioneering drip irrigation and scheduling based on meteorological and other sensor data) and utilization of non-conventional water (recycled wastewater, brackish groundwater, and desalinated seawater). As water scarcity intensifies across Europe, Israel's efficient irrigation methods offer valuable lessons. However, because certain non-conventional water practices pose long-term environmental trade-offs, Europe should selectively adapt only what makes overall sense locally. Meanwhile, Europe currently leads in model- and sensor-based plant water physiology understanding. The key challenge now is adapting these advanced models to fit local economic, agronomic, environmental, and traditional farming realities.

6 FruitCREWS brought together partners from Europe, the Mediterranean and beyond. What did this international dimension add to the work?

As someone coming from outside Europe, I have seen first-hand that managing tree water status is a global challenge that requires global dialogue. FruitCREWS benefited tremendously from extending its reach beyond European borders, including a strong Israeli contingent and key collaborators from North America, Africa, and Australia. Bringing these diverse geographical perspectives together enriched our collective problem-solving and ensured our findings resonated worldwide.

“

Managing tree water status is a global challenge that requires global dialogue.



Alon Ben-Gal with Alexandra Boini and Action Chair Brunella Morandi at a FruitCREWS meeting.





LEGACY INTERVIEW • WORKING GROUP 5

“Achieving real-world impact requires an integrated management approach”

Diego Intrigliolo • Leader of Working Group 5, “Guidelines for implementation into practice”

As FruitCREWS comes to a close, we asked Working Group leaders and Core Group members to look back at four years of the Action. Diego Intrigliolo talks about the FruitCREWS Position Paper, the response of EU policymakers, and what the CAP and the next EU research framework should do to bring innovation to the field.



Diego Intrigliolo in a vineyard.

ABOUT THE ACTION AND YOU

1 What was your main role in FruitCREWS, and which achievement are you most proud of?

I coordinated the identification and prioritisation of Research and Innovation (R&I) gaps with strong potential for future support under European and national funding programmes. My principal contribution was the preparation of the FruitCREWS Position Paper on Research, Innovation and Policy Priorities for Improving Water Productivity and Resilience in Fruit Tree Crops, which helps to define strategic research agendas and policy recommendations to enhance water productivity and climate resilience in fruit production systems.

“

I was positively surprised by how receptive policymakers were to the outcomes of the COST Action.

2 What is your most memorable moment from the four years of the Action?

The annual meeting in Seville was instrumental in collecting input from the FruitCREWS community. Through constructive scientific discussions among researchers and stakeholders, we identified and prioritised key R&I gaps, which provided the basis for the FruitCREWS Position Paper on future research, innovation, and policy priorities.

“

Initiatives of this kind are essential for bringing together researchers, innovators, advisors, farmers, and other end-users to jointly refine technical solutions and, most importantly, demonstrate their effectiveness under real farming conditions.

3 IN ONE SENTENCE: WHAT WILL REMAIN OF FRUITCREWS IN FIVE YEARS' TIME?

“The R&I priorities identified by the network, set out in the FruitCREWS Position Paper and in an Editorial published in *Scientia Horticulturae*, will continue to provide strategic guidance for future research, innovation, and policy actions aimed at improving water productivity and resilience in fruit tree crops.”

Editorial: <https://doi.org/10.1016/j.scienta.2026.114908>



4 If policy makers take only one message from the FruitCREWS Position Paper, which one should it be, and why?

Achieving real-world impact requires an integrated management approach that bridges technical innovations with the socio-economic constraints and opportunities specific to each region. The successful uptake of innovative solutions will depend on their integration into local production systems, institutional frameworks, economic conditions, and stakeholder needs. This will ensure that research outcomes can effectively contribute to greater water productivity and resilience in fruit tree crops.

5 Between the European Parliament workshop in June and the EU AgRI 2040 conference in September, you discussed water resilience with EU institutions. How receptive were they, and what surprised you?

I was positively surprised by how receptive policymakers were to the outcomes of the COST Action. The timing of our work was particularly good, as the main outputs of the Action became available just when the EU Water Resilience Strategy was being launched, with a major focus on increasing water use efficiency. This alignment highlighted the relevance and timeliness of the research carried out by the FruitCREWS network.

In addition, a significant proportion of the research reviewed within the COST Action was devoted to improving water productivity in fruit tree crops. By identifying key knowledge gaps, innovative solutions, and best management practices, the network has contributed valuable evidence to support future policies and research agendas aimed at improving water use efficiency, resilience, and sustainability in the fruit sector. The Position Paper and the Editorial published in *Scientia*

Horticulturae provide a solid scientific basis for these future developments and help bridge the gap between research outcomes and policy needs.

6 What has to happen in the next EU research framework and in the CAP so that the priorities identified by FruitCREWS are actually taken up?

Within the Common Agricultural Policy (CAP), dedicated funding should be allocated to support the deployment of innovation on the ground, for example by continuing and strengthening EIP-AGRI Operational Groups. Initiatives of this kind are essential for bringing together researchers, innovators, advisors, farmers, and other end-users to jointly refine technical solutions and, most importantly, demonstrate their effectiveness under real farming conditions.

While significant progress has been made in developing innovative approaches to improve water productivity and resilience in fruit tree crops, greater efforts are needed to facilitate their adoption at scale. In this regard, more active involvement of regional and national water management authorities is crucial. Their engagement would help ensure long-term continuity, provide an enabling regulatory environment, and promote the integration of successful innovations into water management policies and practices.

Strengthening collaboration between the research community, agricultural stakeholders, and water authorities would not only accelerate the uptake of innovative solutions but also help align technological advances with broader water governance objectives. Such a coordinated approach is essential for achieving lasting impacts on water use efficiency and climate resilience in the agricultural sector.



The FruitCREWS session at the final workshop in Brussels, June 2026.





LEGACY INTERVIEW • GRANT AWARDING COORDINATOR

“To build a career in this field, young researchers must always keep in mind that their results should be readily applicable”



George Manganaris · Grant Awarding Coordinator for the Action's mobility grants

As FruitCREWS comes to a close, we asked Working Group leaders and Core Group members to look back at four years of the Action. George Manganaris talks about the mobility grants that connected the network, the annual meeting in Naoussa, and his advice for young researchers.



George Manganaris at the podium during a FruitCREWS meeting.

ABOUT THE ACTION AND YOU

1 What was your main role in FruitCREWS, and which achievement are you most proud of?

I acted as Grant Awarding Coordinator for the Action's mobility grants. Mobility grants were used extensively as a networking tool, mainly in the form of Short-Term Scientific Missions (STSMs). We managed to use all the available funding in all four Grant Periods. I am glad that a critical mass of young scientists took this opportunity, several of them from Widening countries.

My greatest achievement in this COST Action was the organization of the conference-type annual meeting held in Naoussa, Greece, in June 2025. The scientific program comprised 6 keynote talks, 33 oral presentations and 24 posters, and attracted approximately 120 attendees. The Book of Abstracts can be downloaded from the FruitCREWS website.

“

This talk was a great example of how scientific work can be translated into practical benefits for farmers.

2 What is your most memorable moment from the four years of the Action?

My most memorable moment was the appreciation I received for organizing the meeting in Greece, for both its scientific and its social program.

Among the people I met, I was particularly impressed by the scientific excellence of Dr Pablo Zarco. He delivered a top-notch talk on new developments in hyperspectral imaging to track the effects of water stress on photosynthesis. This talk was a great example of how scientific work can be translated into practical benefits for farmers.

3 IN ONE SENTENCE: WHAT WILL REMAIN OF FRUITCREWS IN FIVE YEARS' TIME?

“The understanding that complementary expertise is a prerequisite, and that there is an urgent need to translate research into value for farmers.”



4 FruitCREWS funded more than thirty Short-Term Scientific Missions and other grants. Can you share one example of a grant that led to something lasting?

I consider particularly important the STSMs carried out by participants from non-academic organizations at academic institutions. One example is the STSM carried out by Jorge Duarte, an independent berry expert, at the Cyprus University of Technology. Its objective was to strengthen the bridge between academic methods and commercial farm decision-making, particularly in irrigation, plant stress and nutrition monitoring, and the post-harvest shelf-life of new berry genotypes.

5 How did the grants open opportunities for early-career researchers and for researchers from Inclusiveness Target Countries?

A good number of applicants from Inclusiveness Target Countries benefited from mobility grants, and the vast majority of beneficiaries were early-stage researchers. I would also like to take this opportunity to thank InoSens for (i) promoting the open calls for mobility grants and (ii) the excellent dissemination of the work carried out,

which is publicly available on the website: cost-fruitcrews.eu/mobility/stsms/

“
They also need to do field work and not limit their activities to the lab.

6 What advice would you give to a young researcher who wants to build a career in water management for fruit crops?

Today, early-stage researchers have a growing number of opportunities to seek funding for networking or for carrying out part of their projects. They should make the most of these opportunities.

Water management in fruit crops is an alarming issue, in Europe and beyond. To build a career in this field, young researchers must always keep in mind that their results should be readily applicable. They also need to do field work and not limit their activities to the lab.

THE ANNUAL MEETING IN NAOUSSA, GREECE, JUNE 2025

6	33	24	~120
keynote talks	oral presentations	posters	attendees



FruitCREWS participants at the annual meeting in Naoussa, Greece.



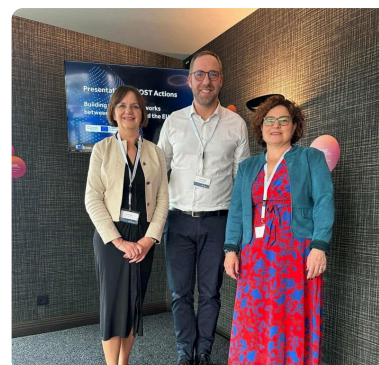


LEGACY INTERVIEW • SCIENCE COMMUNICATION

“Peer-to-peer communication seems to achieve the greatest reach and engagement.”

Vladimir Mrkajić • Science Communication Coordinator, InoSens, Serbia

As FruitCREWS comes to a close, our Science Communication Coordinator, Vladimir Mrkajić, looks back at the team that reported on four years of the Action, presenting FruitCREWS in Podgorica, where he sees the Action's biggest impact, and what it meant for his company.



With Prof. Åse Gornitzka (left), President of the COST Association, and Katalin Alföldi (right) in Podgorica.

ABOUT THE ACTION AND YOU

1 What was your main role in FruitCREWS, and which achievement are you most proud of?

My main responsibility was to coordinate the communication of the many activities, results and achievements of our COST Action. I am most proud of the fact that FruitCREWS had a very active team of communication coordinators, who reported the main activities and outputs of each Working Group: Konni Biegert (WG1), Or Sperling (WG2), Miguel Ángel Pardo Picazo (WG3), Assaf Chen (WG4) and María del Mar Borrego Marín (WG5). Equally important was Jovana Simić, our dedicated Social Media and Website Manager.

I would also like to mention our Chair, Brunella Morandi, and Vice-Chair, Virginia Hernández-Santana, who supported the press releases and scientific publications; our Grant Awarding Coordinator, George Manganaris, who helped us obtain feedback from each mobility grantee, which was very important for spreading the news and promoting the Action's activities among our target audiences; and all the FruitCREWS members who benefited from mobility grants

and shared their experience through social media posts and website articles.

2 What is your most memorable moment from the four years of the Action?

It is difficult to single out one moment, as there were many, but I would highlight two. The first were our Core Group meetings, such as those in Naoussa and Berlin. The second came from an unexpected place. I was invited by the COST Association to the Western Balkans Ministerial Meeting in Podgorica, Montenegro, where I had the opportunity to represent Serbia and to present FruitCREWS at a session on COST's role in research cooperation in the region. It was inspiring to meet COST fellows from across the Western Balkans and to discuss with Prof. Åse Gornitzka, President of the COST Association, and Katalin Alföldi, Policy Adviser at COST, how COST Actions can support researchers from our region. On the same day, I was a featured speaker at the Science|Business Widening Group conference “From Knowledge to Impact: Nurturing Research and Innovation in South-East Europe together with the EU” at the University of Montenegro, where I presented FruitCREWS once again.

3 IN ONE SENTENCE: WHAT WILL REMAIN OF FRUITCREWS IN FIVE YEARS' TIME?

“What I can say for sure is that strong bonds were formed between people from different research institutions, and I am already witnessing that many of our Action members are actively exploring and using opportunities to continue their cooperation.”



4 You represented FruitCREWS at the Western Balkans Ministerial Meeting in Podgorica and at the Science|Business conference at the University of Montenegro. What message did you share about the value of COST Actions for researchers and institutions from the Western Balkans?

My main message was that COST Actions are one of the most accessible entry points into European research for researchers from our region. Through FruitCREWS, researchers and institutions from Serbia and other Inclusiveness Target Countries (ITCs) became part of an international network, gained new skills, took part in mobility grants and built collaborations that would be very difficult to start alone.

At the Science|Business conference, I also reflected on the success of Serbian public and private institutions in Horizon Europe, and on how networks like COST help to turn regional strengths into drivers of European innovation. For many organisations from our region, a COST Action is the first step, and the next step is a joint Horizon Europe project. Representing FruitCREWS at a ministerial meeting also showed me that the work of a single Action can become a good example in a much wider policy discussion on research cooperation.

5 Over four years, FruitCREWS communicated through press releases, newsletters, the website and LinkedIn, and ended with a Position Paper discussed with EU institutions. Where do you see the biggest impact of the Action and its communication, and why?

I would look at impact in three ways. In terms of policy, the biggest impact was certainly our final workshop at the European Parliament Info Hub in Brussels in June 2026. For the first time, our communication was not only about informing the scientific community, but about bringing evidence directly to policy makers, farmers' organisations and irrigation associations. The press releases before and after the workshop, and then the Position Paper, helped us translate four years of research into clear messages for a policy audience.

In terms of science and research, the biggest impact came from joint scientific publications and from the many visits



With Kathy Steppe (left) and Jovana Simić (right) after the FruitCREWS event in Brussels, June 2026.

and short stays of Action members at host institutions. These were particularly beneficial for our younger members and for those coming from ITCs.

Finally, in terms of promoting excellence and the career growth of researchers and scientists in this field, the biggest impact came from personal reports shared as LinkedIn posts or news on our website. Peer-to-peer communication seems to achieve the greatest reach and engagement.

“

COST Actions are one of the most accessible entry points into European research for researchers from our region.

6 You came to FruitCREWS from a background in EU project development and communication, working with InoSens in Serbia. What did the Action give you and your organisation, and what advice would you give to future COST Actions on communicating their science?

For me personally, one of the most valuable benefits was the COST Academy trainings for Action Science Communication Coordinators. During the Action, I attended several of them, and the most memorable were the trainings on media skills and storytelling. COST brought top educators to these sessions, and they really improved my communication skills and the way I work with researchers on their messages.

For InoSens, FruitCREWS meant new partnerships and a better understanding of the research and policy needs in agricultural water management. I also had the privilege of speaking at a few of our meetings about what we do best at my company: successfully preparing and implementing Horizon Europe projects. Some partners were curious to learn more, and we even won a proposal together. My advice to future COST Actions is to take communication seriously from the first day: prepare a realistic communication plan, involve a contact person from each Working Group, use the COST Academy trainings, and think early about how your results will reach policy makers and practitioners, not only other scientists.



Pear orchard visit in Belgium, 2026.

