ASSESSMENT REPORT

Wageningen Plant Research

2023

WAGENINGEN
UNIVERSITY & RESEARCH

HUISJES&CO
Meer waarde uit wetenschap

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The cover photo shows the Farm of the Future in WPR's business unit Field Crops in Lelystad

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Content

Executive summary

The assessment committee was asked to assess the institute Wageningen Plant Research (WPR) on three main criteria: quality of the research (including statutory tasks), societal and economic impact of the research, and viability of the organization. It did so based on a set of documents provided by the institute – mainly a comprehensive self-assessment report over the period 2017-2022 – and a three-day site visit.

The committee assesses the **quality of research** at WPR as 'very good'. WPR is recognized worldwide as a leading player in the field of plant research. In the period under review, it has delivered many outstanding and impactful research outputs, it has trained excellent high-level researchers and proven to be a valued research partner internationally. WPR's research field spans a broad spectrum of topics and and the expertise available allows the researchers to address these topics in the depth. These assets combined give WPR great potential to realize its ambition for playing a vital role in the sustainability transition. The challenge for the future will be to keep the quality of WPR's research at its current high level and to strengthen it even further. To do so, the committee suggests that WPR should strive to refine its research focus and to define a unique selling proposition; to create alignment between the business units; to communicate relevant insights from research in different ways to targeted audiences, in function of their needs; and to ensure that all staff – especially young researchers – are thoroughly trained in scientific integrity.

The committee assesses the **societal and economic impact** of WPR as 'good'. The institute has a strong connection with the Dutch government on priority setting and is an important and attractive partner for its stakeholders. WPR's stakeholders value the institute for the high quality of its (precompetitive) research and the multidisciplinary approach. Areas that offer room for improvement are the translation of research outputs towards direct application – which is now not always effective – and building and valorizing a well-defined intellectual property portfolio. In the committee's view, WPR could further strengthen its position by systematically offering its stakeholders integrated solutions and transformative thinking, instead of incremental measures.

The committee assesses WPR's **viability of the organization** as 'good', but only after some internal discussion. The committee sees a need for improvement, mainly in 3 areas of viability: organizational structure, diversity in funding sources, and diversity and equality in personnel. Concerning

structure, the committee finds it imperative to thoroughly re-evaluate the complex structure within WPR and its intricate relationship with the Department of Plant Sciences at Wageningen University. Does it allow WPR to be sufficiently flexible and agile in the light of future challenges? About funding, there is concern for WPR's strong dependency on the Top Sectors, which – to some degree – are subject to political discretion. The committee strongly recommends the institute to put a contingency plan in place, in case Top Sector funding declines. Regarding human resources, it worries the committee that there is still little diversity in gender and nationality at the higher levels, despite the previous assessment committee's strong recommendation to prioritize improvements on this point.

On the other hand, the committee is enthusiastic about quite a few viability aspects. An obvious one is the steep growth of the institute in the period under review, which demonstrates excellence in quality of research and stakeholder networks. Also, the committee was impressed by WPR's outstanding facilities, such as the *Farm of the Future*, the Netherlands Plant Ecophenotyping Centre, and the AgroFood Robotics facilities. The embedding within the Plant Sciences Group and WUR as a whole may present a complex challenge to handle and manage, but is after all an enormous asset, that allows WPR to translate multidisciplinary fundamental science into impact. Partly in response to the previous assessment committee's recommendations, some commendable steps have been taken that will still come into full fruition. In this context, the *One Wageningen* approach deserves to be mentioned, as well as the *Let's talk together* conversations and the *Empowering employees to take responsibility* ambition in the strategic plan of the Plant Sciences Group. The plan to collaborate with applied universities at the regional level was very appealing to the committee, as well as the first steps that have been taken in public-private sharing of expensive equipment and facilities. However, to the committee, the greatest viability asset for WPR are the immense passion and pride of its employees. It is a cause for optimism that they experience WPR as an exciting, collegial, and generally supportive environment, and that they have a clear view of the challenges that lie ahead. The committee encourages WPR to nurture creativity and interdisciplinary collaborations among its employees, while creating an atmosphere that fuels technological breakthroughs. By fostering such an environment, WPR is well-positioned to make significant contributions in tackling the world's most critical sustainability issues and pave the way for a brighter, more sustainable future.

Considering these aspects and arguments, the committee assesses WPR as follows. For an explanation of the key criteria, see appendix 4.2.

	Quality	Impact	Viability
WPR	Very good (4)	Good (3)	Good (3)

1. Introduction

1.1. Context and aims of the assessment

The executive board of Wageningen University & Research (WUR) asked a committee of peers to perform an assessment of Wageningen Plant Research (WPR) over the period 2017-2022. WPR is one of the institutes within Wageningen Research, and this assessment is a component evaluation exercise within the so-called TO2 evaluation of all five organizations for applied technological research in the Netherlands. It is formally commissioned by the Dutch ministry of Economic Affairs. The basis of the assessment is constituted by the *Terms of Reference for WR institute assessments* (See appendix 4.1). According to these terms, the main goal of the assessment is to assess the institute's (inter)national position and viability. The assessment thereby aids in the monitoring and improvement of the overall performance of WPR and its long-term strategy development. In addition to assessing the institute, the committee was also asked to offer recommendations to support the institute's strategy for the future.

Specifically, the committee was requested to look into the following assessment criteria

- Quality of the research (including statutory tasks)
- Societal and economic impact of the research
- Viability of the organisation

While evaluating these three main criteria, the committee chose to look into certain aspects it considered particularly relevant, such as stakeholder interactions, knowledge translation and use (for societal relevance), human resources strategy, infrastructure, and acquisition and funding (for viability).

1.2. Composition of the assessment committee

The assessment committee consisted of:

- Dr. An Michiels, director of AgKnowledge Partnering (chair)
- Prof. Jean-Marie Aerts, head of the Department of Biosystems and professor at the Division of Animal and Human Health engineering, KU Leuven
- Prof. Angela Karp, director and CEO of Rothamsted Research, UK
- Dr. Isabel Roldan-Ruiz, scientific director of the Plant Sciences Unit of the Flanders Research Institute for Agriculture, Fisheries and Food.

- Monique van Vegchel MSc, policy advisor at Plantum, Dutch association for the plant reproductive material sector

For brief curricula vitae of the committee members, see appendix 4.3.

The committee was supported by Mariette Huisjes MA, who acted as secretary.

1.3. The assessment process

The committee first met online on 1 June 2023 to be introduced to each other, the assessment process, and WPR.

Prior to the site visit, all committee members read the self-assessment report provided by WPR and formulated first impressions and discussion topics. These were discussed within the committee on the afternoon of 12 June, after which the management board of WPR briefly provided some additional information on factual questions the committee had. The site visit then took place on June 13 to 15. The committee was extremely satisfied with the lively honest and open discussions held with all staff. For a full programme, see appendix 4.4. At the end of the site visit, the chair presented some first conclusions to the management board and directors of business units at WPR.

This assessment report is based on both the documentation provided by WPR and the information gathered from the interviews and field trips during the site visit. The committee members each contributed to the writing of the assessment report. The first draft of the report was compiled and edited by the secretary. In an online meeting on 28 June (and partly by e-mail) committee members offered feedback, which was processed by the chair and secretary before a new draft was sent to the committee. By mid-July, all committee members had approved the final draft of the assessment report, which was subsequently sent to WPR. WPR then offered factual corrections and comments. In close consultation with the chair, the secretary reviewed the comments to create the final report.

1.4. Quality of the information

Before, during and after the site visit, the committee received the following documents:

- terms of Reference for WR institute assessments
- self-assessment report 2017-2022 of WPR
- strategic plan of the Plant Sciences Group 2019-2022
- bibliometric report 2017-2022
- the previous assessment report on WPR (2017)
- additional information on collaboration with private companies

- additional information on the organizational structure and budgets
- additional information on the salary gap between men and women
- 12 powerpoint presentations on various topics

2. Mission, structure and strategy

2.1. Mission of WPR

The ambition of WPR is to create knowledge and impact on sustainable plant resources for a healthy world. WPR wishes to play a vital role in enabling the sustainability transition with excellent research, and to translate science into societal impact. To this aim, it is essential that WPR research is adopted by key stakeholders regionally, nationally and internationally.

Some challenges that WPR wants to contribute to are:

- Climate-resilient, nature-positive, low-emissions outdoor food production systems;
- Indoor food production systems that play a positive role in the food and energy economy and in regional communities;
- The necessary transition to a sustainable diet and health;
- Plants and microbes for the circular bioeconomy and bioproducts.

2.2. Structure of WPR and embedding in WUR

Wageningen University Research (WUR) is a combination of two legal entities: Wageningen University and Wageningen Research. Whereas the university focuses on academic and fundamental research and the education and training of students, Wageningen Research covers strategic, application driven and applied research for governments, industry, NGO's and other stakeholders in society. WPR is one of 9 specialized research institutes within Wageningen Research. Its counterpart in the university is the Department of Plant Sciences. Together, WPR and the Department of Plant Sciences form the Plant Sciences Group within WUR.

WPR now consists of 8 business units, led by business unit managers. Most units are divided into teams, led by team leaders. The integral responsibility for research, staff, facilities and finance of the Plant Sciences Group lies with the management board. It consists of a managing director and a director of operations. The managing director is directly responsible to the executive board of WUR. WPR's management board works closely with the works council of the Plant Sciences Group, which represents the interests of all employees.

WPR's main location is Wageningen. The institute has satellite locations in Lelystad, Bleiswijk and 6 other places in the Netherlands, with research facilities close to customers in different branches, and operating on different

soil types. In 2022, WPR had a turnover of over M€ 83,9 and 741 employees (656 fte).

2.3. Strategy of WPR

WPR considers its main strengths to be: its structure, made up of specialized business units; a large and dedicated research infrastructure; and intensive cooperation with other fundamental and applied research groups within WUR. These assets enable WPR to tackle issues through a multidisciplinary approach, via technology as well as through the natural, environmental and social sciences in an integrative way.

In accordance with the 2019-2024 strategic plan of WUR, the Plant Sciences Group has defined 13 critical changes it wants to achieve in order to realize its ambitions in an optimal way. 9 of these are relevant to WPR. As described in the self-assessment report, they are:

- Approach research questions in a *One Wageningen* way, gaining energy from other groups within WUR;
- Share and streamline current networks and identify and build new partnerships;
- Create more awareness of our role as an independent knowledge supplier in the public debate;
- Align with and adapt to societal agendas towards a more proactive way of agenda setting and attracting funds of large donors;
- Empower employees to take responsibility, and fortify an open, supportive and inclusive work culture;
- Enhance collaboration between the university and research parts of the Plant Sciences Group;
- Create more understanding between the primary process and staff divisions;
- Evaluate internal processes;
- Make housing future-proof.

3. Findings and recommendations

3.1. Quality of the research

Scientific reputation

Based on the documentation provided, the committee confirms that worldwide, WUR in general and WPR more specifically is recognized as a leading player in the field of plant research. The institute is renowned for attracting and retaining exceptional researchers and can pride itself on many outstanding and impactful research outputs. Some highlights are papers on FAIR guiding principles for scientific data management and stewardship, new opportunities in biological pest control, and the possibilities of soil-less cultivation. Between 2016 and 2021, WPR's average field weighted citation impact was just over two times the world average. The institute is a valued research partner at the international level, as is shown by the number of joint papers with international partners. Some senior WPR scientists have received distinguished awards, such as inclusion in the international (1 in 1,000) list of 'Highly Cited Reseachers' in the field of plant and animal sciences for the past three years, or the Nils Foss Prize, for innovative research leading to remarkable improvements in the food chain. These results are impressive. The research at WPR covers a very broad field and includes most relevant topics related to plant production research and its applications, from ecology and bioinformatics to seed sciences and robotics and automation. Sufficient critical mass is available to guarantee sustainable research output and innovation. The combination of high research quality, good international reputation and sufficient critical mass gives WPR great potential. The challenge for the future will be to keep the research quality at its current high level and even further strengthen it. The following suggestions may help WPR to do so.

Research output

The committee finds the scientific output of WPR overall of high quality, especially when taking into account that the focus of WPR is primarily on applied research, and less on fundamental research. Nevertheless, per researcher there is a decline in research output in terms of citation count, field-weighed citation impact, percentage of publications in top 10%, etc. During the discussions with WPR-researchers it became clear to the committee that this decline is – at least partly – caused by the collaborations with Top Sector partners that started in 2013. Top Sector funding is linked to specific themes set by the Dutch government, and to the missions of the companies that are involved. This narrows down the topics to work on. Also, some of the research carried out in collaboration with companies is confidential. These factors evidently reduce the number of scientific peer reviewed papers issuing

from Top Sector projects. The relative decline in high-impact scientific publications – which seems an inevitable consequence of the fact that WPR now depends on the Top Sectors for 37% of its funding – illustrates the fact that the generous endowment of WPR in the Top Sectors is not only a blessing, but may in the long run also be a risk. After all, in order to realize its ambitions, WPR needs to keep its position at the international scientific forefront. Meanwhile, scientific papers can be complemented by alternative forms of output. Research reports, actionable advice for users, proofs of concept, software, posts on social media, podcasts, videos etc. are equally useful and go well with WPR's ambition to translate science into impact. Building on the existing efforts at communicating the research in different ways, will be important in presenting the relevance of WPR's outputs to different target audiences.

Uniqueness of WPR research

WPR covers a very broad area of expertise. It is therefore not very clear what makes it unique, or what its specific selling proposition is. According to the committee, the institute would profit from a sharper focus. In an increasingly competitive environment, WPR needs to make choices concerning the research areas it wants to specialize and truly excel in, and to protect its position in these areas by establishing intellectual property (see also section 3.2. on knowledge translation and use). The 8 potential areas for WPR skills development mentioned in the self-assessment report are already a step in the right direction. Strategically chosen and well-protected R&D that WPR truly specializes and excels in can fill new TRL pipelines, for future market niches. This point is illustrated by examples where WPR has already taken a successful longer-term strategic approach in pursuing R&D that initially did not seem attractive to industry, until the innovative solution it offered became clear, such as R&D on the concept of disease susceptibility genes in plants. Once WPR has chosen a few focal areas for its research, these should be crafted into a logical narrative which is communicated to all WPR employees. They can become 'ambassadors' of the main assets, priorities and ambitions of WPR, and share the narrative with stakeholders.

In meeting societal challenges, it seems increasingly desirable to integrate social aspects; this applies to plant research as well as other areas. WPR's connection to the Social Sciences Group within WUR means that the social context can be easily integrated in WPR research projects. From the committee's perspective, this remarkable advantage deserves not only to be cherished but also maximized to its fullest potential.

Alignment of research

Even though WPR considers its structure with eight business units as one of its strong points, to the committee – and probably to many outsiders – it has

aspects of scatteredness, or even ordered chaos. The committee found that some identical or similar topics are investigated in several business units, without manifest alignment. This is for instance the case in areas such as data analytics, innovative sensor technologies, robotics and AI. At the level of WUR, programmes on these research topics already cover different groups, but not yet at the level of WPR. In the committee's view, it would be good to foster collaborations between the units on common topics. Also, in general, interactions and a steady flow of information, as well as alignment between business units and within business units should be guaranteed. This contributes to research quality and efficient use of research budgets by creating maximum synergy and avoiding too much overlap. The regular meetings at WPR level of business unit managers are already a strong point (see also section 3.2. on collaboration within and structure of WPR).

Future focus

WPR's research area in breeding in connection to horticulture has historically grown and for the future WPR aims to stick to this core expertise, and not to chase every new fashionable topic. Although the committee finds this a good approach, it should also be taken into account that relevant topics and funding sources and crops are changing over time. The committee therefore encourages WPR to continue investing in crop development and breeding of novel crops. By embracing cutting-edge techniques such as genome editing, precision breeding, digital phenotyping, and genomic selection, the institute can accelerate the development of improved crop varieties with enhanced traits such as higher yields, disease resistance, and environmental adaptability. Investing in research and development efforts that leverage these novel breeding technologies will not only bolster the institute's research portfolio but also contribute significantly to addressing global food security challenges and to promoting sustainable agricultural practices. By working closely with farmers, industry partners, and regulatory bodies, the institute can ensure that these advancements in crop development are effectively deployed and have a positive impact on agricultural systems worldwide.

An example where WPR did identify a future focus, is plant Artificial Intelligence (AI). WPR has embraced AI. Integrating AI technologies into crop development can offer WPR's partners opportunities for accelerating the development of improved crop varieties. Machine learning algorithms can analyze vast amounts of genomic data, phenotypic information, and environmental factors to identify patterns, predict traits, and optimize breeding strategies. By leveraging AI, the institute can help its partners to expedite the breeding cycle and by doing so, reduce costs. The committee fully endorses this choice, since AI is developing at a high pace and opens up great opportunities for plant science and plant breeding. It strongly recommends

WPR not to consider AI as an end in itself, but always bear in mind the purposes for which it is used.

Research integrity

The committee found that research integrity is well-covered by the policies and actions defined at the level of WUR. There is a strong attention for social safety, including sensibilization actions at all levels of the organization, and the translation of general WUR rules to specific contexts and situations at the level of business units. There is a system for the handling of formal complaints at the level of WUR. A strong asset is the existence of the Data Competency Center, also at the level of WUR. By aligning with all relevant WUR policies and instruments, WPR is well-armed to respond to current and future challenges, such as the integration of artificial intelligence in its activities. Research integrity is a critical pillar of WPR's mission, and the committee acknowledges the institute's commitment to maintaining its independence and upholding scientific principles when collaborating with industrial partners, and not let research results be steered by non-scientific interests. This should always be top of mind, in order for WPR to be a reliable partner for all stakeholders. The committee encourages WPR to continue prioritizing research integrity as a guiding principle, fostering an environment where scientific excellence and impartiality thrive. Regular self-assessment, peer reviews, and robust ethical guidelines can further strengthen WPR's commitment to research integrity, ensuring that its contributions to global sustainability challenges are grounded in the highest standards of scientific rigor and objectivity.

Statutory research tasks

One of the business units within WPR is the Centre for Genetic Resources. This gene bank of plant materials has a special status as the executor of a Statutory Research Task, a non-economic service in the public interest regulated by law and directly funded by the Dutch Ministry of Agriculture, Nature and Food Quality. In this case, the research task is the conservation of a large gene bank of plant materials. The Centre for Genetic Resources is involved in some research projects, but such research represents less than 10% of its funding. The research concentrates on methodological aspects of plant genetic resource management.

The committee found that the Centre for Genetic Resources uses its position in WPR's high-tech environment well; it is at the forefront of innovation in the field of global plant genetic resources management, and originates new ways to optimize procedures. The committee also found that this business unit appears deliberately somewhat isolated from other WPR activities and programmatic content. Although the committee endorses this position - in keeping with the the Centre's independent status, the committee also

recommends the Centre for Genetic Resources places more effort on ensuring that researchers have sufficient access to the knowledge and material, so that WPR's research can internally profit from it's location there.

Recommendations

- Value scientific papers and other kinds of output equally. Communicate relevant research in different ways, taking into account the needs of the targeted audience.
- Create focus in WPR research and define WPR's unique selling proposition. Communicate this well with all employees.
- Avoid overlap in research activities. Create alignment between the business units. Consider establishing a WPR-broad research fund that is used to support key research projects contributing to WPR's unique selling proposition.
- Continue to prioritize scientific integrity. Take care that young researchers are thoroughly trained to stand their ground when working with industry, and to retain scientific independence.
- Make sure that all researchers have access to the gene bank of the Centre for Genetic Resources.

3.2. Societal and economic impact of the research

Agenda-setting

The committee found that WPR has developed a strong, nationally and internationally acknowledged position as a leading institution addressing societal challenges in food production. There is a clear focus on alignment with the Sustainable Development Goals of the Unitede Nations, and the WUR brand is highly recognized. This puts WPR in an excellent position to contribute to agendas.

In its self-assessment report, WPR presented a strategy for agenda setting which is a mix of circa 50% sustainability targets and 50% alignment with the private sector needs. It is a definite positive that WPR's managing director has a position within the top team of the Top Sector Horticulture and Starting Materials, as this provides a direct connection with the government priority setting of the Ministry and a chance to contribute to and influence the calls issued. While WPR's connection with the national policy is strong, the committee found it harder to identify a clear WPR strategy for agenda setting towards the needs and interests of farmers and breeders. During the site visit, there was mention of the challenge presented by the polarized debate over the future of farming in the Netherlands. WPR could play a constructive role here through evidence provision and balanced recommendations, but the committee found few signs of an appetite to play such a role, nor of ideas for who could do this within WPR. There are of course risks attached to engaging

in this debate, and they are recognized within WUR, but these risks could be mitigated by careful selection of the staff involved as well as through preparation and training.

Stakeholder conversations

The committee received a strong and consistent message from all stakeholders interviewed during the site visit that WPR is an attractive and important partner for them, due to the breadth and excellence of its science and facilities. WPR was spoken very highly of and all employees should be pleased with this achievement. There is no room for complacency, however. Rather, the current strong reputation needs continual work to maintain and improve it.
There were a few less positive experiences shared with respect to delivery of research products: examples of delays and outputs falling short of expectations. However, overall, the view was that WPR did deliver, and could be relied on. Some stakeholders suggested that improved and continual engagement between WPR researchers and the companies they work with would ensure that expectations were in line with what could reasonably be achieved within the project timeline. Stakeholders perceived that some of the researchers have unrealistic views about the readiness and relevance of their findings. In these cases, as well, conversations at an earlier stage could be beneficial in reducing wasted effort. Some stakeholders were concerned about overload and stress among WPR project leaders, which were in their perception caused by insufficient training.

It is not relevant to stakeholders whether researchers belong to WPR or the Department of Plant Sciences. However, it is their experience that navigating round the complexity and diversity of the organization in order to reach relevant contacts is not always easy. It is especially difficult for small and medium size businesses. Stakeholders also told the committee of redundancy and lack of coordination within WPR – often leading to different conversations occurring in parallel, duplication of project activities, and internal competition towards the same external partner or customer

Stakeholders view WPR's multidisciplinary way of working as highly attractive. A point to be taken into account is that whereas companies sometimes work through trial and error without knowing the process, research at WPR on the other hand focuses on understanding the underlying mechanisms. For many companies, this aspect is an important added value that convinces them to continue working with WPR. The committee believes the institute could strengthen its position by offering integrated solutions, as stakeholders now increasingly seek these. Similarly, there is a view that WPR thinks too often in terms of small incremental steps, while stakeholders expect more ideas on step-changes and transformative thinking from them – especially as WPR is so

well-positioned to offer these, and has such an excellent mix of science and expertise.

Although farmers were not included among the stakeholders in the committee interviews, WPR engagement with farmers appears to be healthy and increasing, following the development of unique facilities such as the *Farm for the Future* and the renewed possibility to run shows and events, which attract very large numbers of farmers.

In conclusion, it gratified the committee to see an expansion of WPR connections with society and partners in the period under review. This has created, and will continue to create societal and economic impact. As a next step, it might indeed be interesting to explore new connections and not just share and streamline current ones, as is one of WPR's strategic ambitions. The institute can grow towards further diversifying its network, as there are new players on the field: large food companies, digital players and investment funds. They are important and cannot be ignored.

Knowledge translation and use

WPR is a professional R&D organization that provides high level R&D project services. Considering the results, the institute should be congratulated on having done so well. With 83% of the respondents in a 2022 survey scoring 'satisfied' or 'very satisfied', customer satisfaction is very high overall. The self-assessment report presents many excellent examples of application and uptake of knowledge in strategically relevant areas such as air emissions, fertilization, and sustainable farming. There are also clear benefits demonstrated in terms of environmental impact (e.g., ammonia reduction) as well as commercial benefits (e.g., double haploids). There is a clear media strategy and the use of narratives is excellent. Many occasions where WPR staff contributed at stakeholder meetings and workshops were mentioned in the self-assessment report and during the site visit. On the other hand, it needs to be noted that in the survey almost one third of customers were not sure what the results WPR delivered could be used for. When the committee explored this topic during the stakeholder interviews, it became clear that some companies will keep the research most vital to them in-house, and engage in more pre-competitive or exploratory research when collaborating with WPR. In spite of the results not being directly usable, WPR is still seen as an advantageous partner, as otherwise such pre-competitive research may be difficult to achieve.

The committee found that improvements could be made in the effective translation of research outputs towards direct applications. Moreover, WPR project leaders could optimize communication and reporting in a way that their customers or users understand the results. An option would be to include

additional resources into the project specifically for translation. This can be achieved either through a third party or by bringing in trained WUR staff specifically skilled in knowledge translation. In this regard it may be worthy to consider training a group of WPR staff that could undertake this role for different projects. In addition, a more continuous engagement between WPR and stakeholders during a project, as suggested above, would help ensure that outputs meet the needs of their customers. It may also be worthwhile to stay in touch with the users after a project is finished, to help them make use of the results in their own organization. As an added bonus, such closer connections will encourage more co-development and provide early sight of either potential problems or unexpected, interesting findings that could (under joint discussion) be deemed important to pursue. This can be also an effective way to increase overall customer retention.

The self-assessment report mentions that close collaborations with the AgTech industry may clash with the perceived independent role of a knowledge institute. Conversely, the committee finds it is essential to highlight the positive contributions of WPR in translating research into applications through entrepreneurship, startups, and scaleups. The lack of visible startups originating from WPR – despite its great potential – raises questions about the effective transfer of research to commercial ventures. Therefore, it will be important for WPR to further develop entrepreneurial skills within its management board, as well as in the overall WPR organization. Exploring the reasons behind successful and unsuccessful spin-off companies and assessing the (potential) value of intellectual property generated by WPR in startup initiatives would provide valuable insights.

Initiatives such as the *Club of 100* (an association of companies that funds precompetitive research in horticulture) and *Farm of the Future* (a WPR pilot farm in Lelystad that demonstrates sustainable arable farming in practice) have proven successful in strengthening relationships between WPR and its stakeholders. The *Club of 100* currently comprises a diverse group of private companies in a specific area of enterprise. It could be beneficial to explore the same model for other areas, especially as a means of improving the relationships with small and medium size businesses and their potential role in research translation, e.g., through consortia projects.

The committee was satisfied to learn that WPR will be proactive in responding to the Ministry's plans for Living Labs, innovative eco-systems for co-creation between knowledge producers and knowledge users. However, it thinks WPR will need to position itself well and present one or more unique selling points to be competitive among the many Living Labs likely to be developed. In general, active engagement, well-developed communication methods and

careful messaging will be key in reaching farmers and building trust. As far as possible, the message should signal that WPR's role is to empower farmers to adopt better practises and make their own decisions based on their own data on their farms. Such a message would help dispel mistrust that the data will be used for government regulations without farmers' knowledge, or in ways that create a dependency in which the translation of farmer proprietary data are potentially used for the benefit of a third party.

The committee is somewhat concerned that there does not appear to be a pipeline of IP in the making, nor even a strong appetite for creation of IP among some staff. This omission is a weakness, in the committee's view. Intellectual property is an area of opportunity for WPR as a means of diversifying future income streams and attracting entrepreneurial talent. The importance of protecting assets for both impact realisation and revenue building (albeit under slow time scales) should be communicated more clearly to employees. This could be, for example, through championing the examples already existing and how they have benefited society and WPR, as well as the individual researchers and entrepreneurs involved.

Recommendations

On agenda setting

- Choose your position with regard to policy topics (for instance centre of expertise, advocacy, advice) and set up a clear corporate narrative about this position for your employees.
- Build capabilities in policy-engagement, learning from models that other knowledge institutes use.
- Select talented employees to talk to journalists and press on policy-issues. Train and brief them well and ensure all queries/invitations are directed only to them.

On stakeholder conversations

- Bring stakeholders new innovative and beyond state-of-the-art strategies that are too long-term and risky for companies to invest in by themselves. Facilitate their transition into the future. Create networking opportunities to investigate the needs of stakeholders, potentially together with business associations.
- Create one clear entry point for all stakeholders to contact and navigate WPR.
- Professionalize business management by training project managers in how to interact with external stakeholders.

On knowledge translation and use

- Train project leaders to understand the needs of stakeholders or increase customer-centricity by hiring a partner to tailor WPR's reports and advice.
- Explore whether the *Club of 100* approach can be expanded to other areas or entrepreneurship.
- Keep or rebuild capabilities in agronomy and practical breeding, since these skills are key in closing the gap between science and practice.
- Living Labs are a promising development. Position yourself effectively to gain a competitive edge.
- Emphasize that the goal of on-farm data gathering is an empowerment for farmers to take better decisions on the management of their farms.
- Define your envisioned IP portfolio and market niche. Also make a plan to valorize your IP.

3.3. Viability of the organization

Collaboration within and structure of WPR

WPR aims to foster a culture of trust and calculated risk-taking by encouraging the sharing of scientific information, data, and know-how among colleagues. Although still not perfect, internal co-operation within WPR has been strongly promoted by the management board, and embraced by the business unit managers. The committee found substantial improvement in this area. Examples are:

- *One Wageningen*, a WUR-wide approach to enhance synergy
- regular meetings of all business managers with the management board to exchange information, identify needs and find solutions
- mobility between different business units, and the initiative to form inter-disciplinary researchers through internships at different business units
- the onboarding programme for all new employees (including PhD students), involving a tour across field locations, at least in some groups.

However, researchers mostly refer to collaborations with other business units when they are engaging in joint research projects, or initiatives to share infrastructure. While such initiatives should be strongly supported in the future, the committee is of the opinion that collaboration on a project basis alone is not sufficient. As was already mentioned in section 3.1., the committee strongly recommends joint programing across business units, based on joint strategic thinking across WPR. This also implies joint decisions on how to use (part of) specific budgets such as the Knowledge Base Budgets and TO2 budgets to implement integration across business units at the level of the research areas, skills, technical facilities, etc. In the committee's view, joint programming would improve internal coherence, promote internal mobility of staff, and in some cases even improve the possibilities to retain key staff

members on the long-term. It would also avoid duplication of expertise and increase critical mass in specific areas.

Though it was not possible to perform a thorough evaluation of the functioning of each business unit, the committee got the impression that they function rather autonomously, that they are each structured differently and that their current area of focus is in some cases based on history. In the committee's view, the current structure may not be sufficiently agile, flexible and responsive to cope with changes that are coming. Innovative power and forward-moving dynamics are deeply engrained in WPR's DNA, and should also be applied to its own structure. A reduction in the number of business units could increase agility and future-proofness. By reducing the complexity of operations and consolidating resources, the organization becomes nimbler and more adaptable in responding to changing market dynamics. Fewer business units allow for better coordination and communication, enabling faster decision-making processes and more efficient allocation of resources.

Furthermore, to improve collaboration and reduce complexity, the committee recommends to explore options for step-by-step simplification wherever possible. By streamlining processes, clarifying roles, and optimizing communication channels, WPR can create a more efficient and accessible environment for staff and stakeholders.

Collaboration within and structure of the Plant Sciences Group

The coexistence of Wageningen University and Wageningen Research on one campus enables collaboration and knowledge sharing. The committee found it remarkable to witness how such a large organization as WUR is internally interconnected and closely linked. The connection between WPR and the Department of Plant Sciences is a great asset, as it enables research and the development of solutions to be achieved through the integration of fundamental and applied research, and as well as an approach to research topics that has both breadth and depth. In the committee's view, this interconnectedness should be further leveraged to maximize the benefits for all stakeholders.

During the site visit, it became clear that some of the financing mechanisms within WUR and of funding organizations hamper optimal organizational structures and may stand in the way of further integration. In several cases, these funding mechanisms create constraints for WPR. For example, different cost calculation schemes on the university and the research side can prevent a higher level of integration.

On the other hand, the increase in the number of PhD candidates who work at WPR with a supervisor from the Department of Plant Sciences is a good way to stimulate further integration within the Plant Sciences Group. In 2 of the 8 business units (Biometrics and Plant Breeding) both teams have been merged. Such restructuring provides opportunities to fully benefit from the newest fundamental knowledge coming from the university by directly translating it to more practical applications by WPR. It also fits well with the fact that the Department of Plant Sciences is becoming more involved in applied research, which was formerly the exclusive focus of WPR. This blurring of the boundary between fundamental and applied research is a general trend, inside and outside of WUR. As part of the *One Wageningen* approach, WPR could investigate the model of merging WPR and the university's Department of Plant Sciences in more or perhaps even all of its business units, following the example of Biometrics and Plant Breeding. This could harness synergy and help to balance research quality and customer satisfaction in an optimal and more controlled way.

Human resources strategy

The committee was impressed by the immense passion and pride that WPR-employees have for their work and their institute. This is testament to a supporting work-environment, interesting and challenging research and close cooperation. Also, WPR's management really presented themselves as a well-functioning team with a clear ambition to keep WPR at the top of the international research arena.

In many respects, WPR has responded well to the recommendations of the previous assessment committee by implementing several improvements in its human resources strategy. Excellent examples are rooftile constructions for the hand-over of knowledge, and the introduction of *Let's Talk Together*-conversations on personal development and mobility. A skills gap analysis is conducted regularly and a clear strategy for effective onboarding and retention is in place. While the committee highly appreciates such initiatives, it also found that some management policies and initiatives do not reach the work floor. This should be a point of attention.

The general demographic distribution within WPR has improved since the previous review, particularly in terms of a healthier age distribution. While strides have been made in balancing the male-female ratio and addressing differences in average salary between male and female employees, the committee sees room for further progress in these areas. The data provided show that in the higher salary scales (12 and above), the disparity in salaries of male and female employees diminishes significantly, reaching a commendably low margin of 0.5%. Also, the proportion of female staff members occupying positions in scale 12 and above has shown remarkable progress, increasing from 17% in 2017 to a notable 27% by the year 2022. Nevertheless, the *average*

salary of a male staff member of WPR is still over 10% higher than that of a female staff member.

Also, where at a first glance WPR seems diverse in that it has a high percentage of international researchers, they are often junior researchers. At higher positions, there is less cultural, nationality and gender diversity.

Equality, diversity and inclusivity have been demonstrated to improve an organization's creativity and performance. Embracing a diverse range of perspectives, experiences, and backgrounds fosters a rich and dynamic environment that promotes innovation and problem-solving from multiple angles. WPR is conscious of this and has put some measures in place to ensure that equality, diversity and inclusivity are given more attention in the recruitment process and in performance committees. Moreover, WPR has established a social safety programme and is committed to use a remuneration policy according to the Hay job evaluation methodology, which minimizes subjectivity and enables rational decisions on roles and their assessment. For job position advertisements, the HR team works with inclusion experts to use inclusive language. All of these measures seem sound to the committee, and it acknowledges the commitment of WPR's managers to equality, diversity and inclusivity. It is imperative that attention remains focussed on these values and that measures to increase them within WPR are consistently and resolutely implemented. The committee is convinced that this will eventually yield the positive outcomes that are still required.

The COVID-19 crisis has significantly impacted WPR in terms of organization, management, internal communication, and collaboration. The importance of good leadership, social cohesion, and hybrid working has been recognized. The commitment and expertise displayed by the business unit managers are commendable. Their depth and breadth of knowledge contribute significantly to the success of the institute. WPR emphasizes enhancing leadership skills among its managers to create a safe and inspiring environment. A leadership development trajectory is structured to align with the WUR leadership profile and aims to support continuous learning and growth within the leadership team. The committee fully endorses this, as long as it is made transparent what training programmes are available, who is eligible and what are the admission criteria.

Deficiencies in training surfaced many times throughout the discussions during the site visit. This indicates that the *Empowering employees to take responsibility* pillar of the WPR strategy needs to be carefully monitored. The committee recommends the WPR management board and business leaders to consider whether more time can be earmarked for training and personal development. It should not be the case that non-project time is only used for acquisition. Training programmes should include project management, people management, policy support, communication, translation of scientific results, proposal writing and intellectual property.

During the discussions with junior researchers, it became clear that from their viewpoint, WPR provides an exciting, collegial and generally supportive environment. However, there was also a prevailing sense that it is often up to the individuals to take the first step towards finding new development opportunities for themselves. The complexity of the organization can make this difficult. Researchers are not always clear on what training is available and whom to reach out to for exploring opportunities. In addition, the high number of projects that need to be managed and the requirement to continually acquire new ones can be stressful. Although *Let's talk together* meetings between business unit managers and individual researchers on their well-being and development do take place, they do not occur frequently. Whilst some individuals thrive in such circumstances, others can feel a bit lost. What contributes to this is that because of the flat matrix structure, the gap between team leaders and business unit managers may be too large. Decreasing the span of control for managers and identifying team leader roles and responsibilities in between these layers could help to make junior researchers feel more looked after. It will also create more development opportunities for individual employees.

The impending retirement of senior management and staff raises the importance of succession planning. Current efforts have focused on leaders and managers, but it is essential in the committee's view to extend these efforts to the development of talent across the institute. Creating opportunities for middle management or senior staff to transition within WPR or WUR will contribute to overall career growth and improved succession planning. The committee was therefore happy to read in the self-assessment report that WPR stimulates mobility, both within WPR and within WUR. It encourages WPR to outline plans for career and team development activities. This will require some extra effort, but investment in future leaders is always energy and money well spent. Enhancing mobility could also increase the possibility to form diverse and agile research teams that focus exclusively on new and emerging questions or technologies.

Acquisition and funding

WPR has shown steep growth during the period under review: from a total staff of 485 fte in 2017 to 656 in 2022, and from a total funding of M€ 64.9 in 2017 to M€ 83.9 in 2022. This bears witness to the good quality of research and excellent relationships and networks with stakeholders. The committee compliments WPR on its continuous work to maintain those relationships, and the passion with which each employee of WPR performs their work.

That being said, while WPR is financially healthy at this time, the breakdown of the different funding sources shows a weakness. WPR relies heavily on Top

Sector funds (and accompanying private co-funding) for 37% of its income. Top Sector funding has been a stable and reliable source of income for WPR, in part due to the funds from the Ministry that are specifically allocated to WUR. But being dependent to such an extent on one type of funding that is heavily influenced by political fashions or trends, is risky. In the committee's view, WPR needs, as a priority, to develop a long-term contingency plan in case Top Sector funding – for whatever reason – starts to decline. The committee heard that WPR is already diversifying its income streams, and fully endorses this.

Through the Knowledge Base budget, the Ministry provides funds directly to WPR to prepare for tomorrow's demands through knowledge and technology development. The importance of this budget cannot be overstated. It serves as the main route for maintaining and expanding strategic, vital research that is crucial to remain competitive in areas where there is no private interest yet, but that might become relevant in the future.

Funding from the European Union represents a very small part of WPR's overall funds. This surprised the committee, given the excellent international position of WPR and its extensive network. The committee understands that there are reasonable explanations (other types of funding have increased and EU subsidies are very competitive), but still recommends a critical look at how EU funding can be increased.

Last but not least, the committee recommends WPR to think outside of existing funding schemes. Other modes of funding should be explored, for instance following the example of the *Club of 100* or other consortia-based funding. By aggregating fees from private partners into one fund, WPR can create more room for strategic and/or privately sponsored research, independent of any public funding schemes. This could be explored in close collaboration with various business associations, to help reach private partners that do not yet have a long-standing relationship with WPR.

Co-operation with external partners

By creating new collaborations with partners outside WUR, WPR could make more strategic use of its funds, and open up novel ways of communicating with stakeholders. For instance, working with applied universities will provide great opportunities to translate more fundamental research to applications within one project. It therefore pleased the committee to hear that a roadmap is being drafted within WUR to break down the barriers between the two types of institutions, and kickstart collaborations with applied universities in a regional setting.

The committee found that WPR collaborates extensively with international partners, but these collaborations seem incidental rather than strategically initiated and WPR appears to be more a reactive than a proactive partner. The committee encourages WPR to operate more strategically with international partners. This could for instance be done by identifying specific thematic and/or geographic areas and/or crops, and by proactively recognizing complementary partners in the global North and South.

Facilities and long-term experiments

The committee was impressed by WPRs infrastructure. The *Farm of the Future,* for instance, is outstanding. This unique facility creates an appealing and professional environment that reflects the innovative nature of the activity undertaken there. The Netherlands Plant Ecophenotyping Centre, and the AgroFood Robotics facilities are also impressive. The committee thinks it is crucial to identify the unique selling points of WPR's present facilities and determine which other facilities or equipment are critical to delivering unique experiments and results, related to the research areas that WPR wants to focus on (see section 3.1.). This analysis will help prioritize WPR's investments and allocate resources appropriately to ensure that the infrastructure achieves its intended goals.

To foster collaboration and maximize the utilization of shared facilities, it is crucial for researchers within WPR to understand each other's research and facilities. In the committee's view, it would therefore be fruitful to provide a transparent and comprehensive document explaining these, including the availability and accessibility of the facilities. Furthermore, efforts should be continued to streamline the process for WPR-employees to access WUR facilities and vice versa. Possibly one facility and technology sharing platform across WUR is an option, as part of the *One Wageningen* approach. Resolving any existing barriers that hinder collaboration and shared facility usage is essential for promoting joint infrastructure investments and future collaborative research work.

To support its mission of innovation, it is vital that WPR keeps having access to the newest technologies and equipment. When a research team has daily access to a new technology platform (i.e., sequences, proteomics analysis platform, indoor farming unit, …) it can lead to excellent high impact papers and the development of new applications. However, from the moment the technology becomes mainstream, having this technology or platform still running in one of WPR's medium throughput research facilities might become relatively expensive. At that moment, access to professional external routine service will be more cost efficient. Therefore, developing an onboarding and exit plan for new technologies and equipment will be important. This may involve transferring or selling protocols and machinery to external or internal

service units, within WUR or WPR. It will help optimize resource allocation and reduce financial burdens. In addition, it could be considered to set up a Capital Expenditures investment plan, including a dedicated Operating Expenditures overview for training staff and yearly maintenance support. Moreover, a service model could also be explored for greenhouse and field trialing, metabolomic analysis or plant transformation services. A service-based approach to share large equipment and facilities can lead to cost savings and increased efficiency. It will also bring a diverse group of researchers together around the equipment to explore new ideas for collaborations. To enhance the effectiveness of research infrastructure, the committee suggests that the suite of phenotyping facilities is presented (internally and externally) as an integrated pipeline that encompass the entire process, from discovery to early and late validation. This pipeline should include a strong focus on data collection, analysis, and AI expertise.

Future strategy

WPR's ambitions for 2024 and onwards are based on a thorough analysis of its position in relation to its environment. In its self-assessment report, WPR has identified 4 key societal challenge areas that it wants to contribute to and 8 potential areas in which it may want to invest. During the site visit, it became clear to the committee that WPR as a whole, but also individual researchers and teams, have a clear view of the future challenges. They define their main areas of research in a good perspective to offer solutions to tackle these challenges. The future success of WPR will, however, rest upon its ability for agile and adaptive response to changes in the funding landscape. It is for this reason that the committee strongly encourages the leadership teams to think more creatively about new and improved ways of working, of generating value through e.g. IP and of organizing and developing both their excellent facilities and excellent human resource base.

Recommendations

On collaboration within and structure of WPR

- Rethink the way you manage your knowledge and talent. This is necessary in order to remain flexible, agile and responsive to future changes and remain competitive compared to other research institutes and companies with increasing research capacity.
- Examine the successful integrated model of the business units Plant Breeding and Biometrics for potential application in other business units.
- Promote a shared leadership vision and create a cohesive *One Plant Sciences Group* view among the leadership team.
- Create mechanisms that enable or enforce close collaboration and joint programing across business units, based on joint strategic thinking.

On co-operation within and structure of the Plant Sciences Group

- Evaluate the tensions that stand in the way of integrating WPR and the Department of Plant Sciences and propose ways to mitigate them.

On human resources strategy

- Profile diversity and inclusivity as desirable values in all communications.
- Develop a short-term action plan for improving gender diversity and closing the gender pay gap. Specific attention should be given to middle and higher management levels.
- Diversify your personnel at middle and senior management positions by enabling women and internationals to grow and by attracting female and international talent from outside WPR and WUR.
- Introduce a regular 'reality check' of what happens on the work floor and if and how management plans are perceived, in the form of targeted feedback collection.
- Facilitate alternative career paths besides research, such as people management, policy support, communication, translation of scientific results, proposal writing and intellectual property.
- Make team leader a clear role and support it. Consider identifying portfolio leader and team leader roles between business unit managers and researcher, especially in larger business units.
- Continue stimulating mobility within and outside WPR. Plan career and team development activities.

On acquisition and funding

- Continue diversifying your income streams and identify a long-term contingency plan in case Top Sector funding starts to decline.
- Look critically at how EU fund ing can be increased.
- Think outside of existing funding schemes and explore other possibilities.

On collaboration with external partners

- Translate your roadmap for collaboration with applied universities into concrete actions.
- Proactively work on a partnering strategy for the global North and South.

On facilities and long-term experiments

- Decide which facilities are critical to your core research areas to prioritize investments.

- Consider a combination of funding sources for large and critical infrastructures.
- Evaluate public-private sharing of equipment across WU and WR teams.
- Create visibility and overview of available facilities and resolve any barriers that hinder shared use of facilities withing WUR.
- Develop an onboarding and exit plan for expensive technologies and/or explore a service model.
- Set up a Capital Expenditure investment plan for cutting-edge equipment.

4. Appendices

4.1. Terms of Reference for WR institute assessments

1. Introduction

Wageningen Research (WR) is one of five so called TO2 institutes (applied technological research institutes) in the Netherlands. Every four years, the TO2 organisations are assessed in their entirety, with sub-evaluation committees for each of the TO2 institutes, commissioned by the Ministry of Economic Affairs and Climate. As part of their quality assurance cycle, the individual research institutes that make up WR are additionally evaluated by a peer review committee every five years. The WR institute assessments are commissioned by the Executive Board of WR. The guidance for the institute assessments is derived from the national protocol for the TO2 evaluations.

The ambition for WR institutes is to conduct excellent research that addresses market failures, supports governmental policy, and finds solutions to problems in society or industry. Activities of WR research institutes alongside research include management of research facilities, acquisition, consultancy, public relations, and developing intellectual property.

The main goal of the WR institute assessments is to assess the institute's (inter)national position regarding research quality, economic and societal impact of the research, and viability of the organisation, in light of its own mission. The assessment thereby aids to monitor and improve the overall performance of the WR institutes and their long-term strategy development.

2. Process

The institute assessment is based on a self-assessment report provided by the institute and a site visit by the assessment committee, which will also include a thorough interaction with its clients. Performance over the last four years and future potential of the institute should both be assessed.

The evaluation criteria (research quality, economic and societal impact and viability, as described in detail in Annex A, with indicators in Annex B) should be assessed in light of the institute's mission, using a four-point scale (Annex C). The evaluation committee is asked to report their findings and offer recommendations to the Executive Board of WR and to the Management Board of the Institute. In response to the assessment committee's recommendations, the Management Board will make an action plan, which will be discussed with the Executive Board. The implementation of this action plan will be monitored in the institute's planning and control cycle. The assessment report and action plan will be submitted to the Ministry of LNV, after which they will be made publicly available.

3. Objective

The overall objective of the assessment is to get an accurate view of the institute's (inter)national position with respect to research quality, economic and societal impact of the research, and viability of the organisation. This assessment will be used internally to make improvements within the organisation, and externally for our accountability to Government and other stakeholders.

4. Result

The committee is requested to report its findings in an assessment report according to a format that will be provided by the secretary, including the scores for each of the criteria with underlying argumentation. Committee members are expected to provide the texts for the assessment report, with secretarial support from the secretary. In cases where the assessment committee's judgment is not unanimous, different views should be stated explicitly.

5. Terms of reference

The committee is requested to concentrate on the following criteria:

a. *Quality of the research*
b. *Societal and economic impact of the research*
c. *Viability of the organisation*

Research quality and societal and economic impact demand a retrospective assessment with special attention to historical data such as volume and sources of income, societal visibility, customer orientation, and scientific output and citations. The viability of the organisation demands a focus that is more directed towards the current and future situation with special attention to market attractiveness and research management.

The sub-criteria to qualify these key-criteria are presented in Annex A, with indicators detailed in Annex B. The background information, necessary for the assessment, is provided in the institute's self-assessment report.

Quality of the research

The first key question for the WR institute evaluation is:
What was the quality of the institute's research in the evaluation period?

The quality of WR research must be assessed in a different way from the quality of academic research. This is due to the different roles that WR institutes and academic knowledge institutes (e.g. universities and KNAW/NWO institutes) play in the research and innovation system. Typical WR research is: (1) research for building and maintaining their strategic knowledge base, (2) precompetitive research in collaboration with private and public parties, (3) Programmatic research for policy-making knowledge, (4) contract research, (5) statutory research tasks (separate criterion).

The output of WR institutes is diverse and comprises more than scientific publications. The evaluation therefore also takes into account how the institute's various stakeholders rate the research quality. This is measured via direct questioning (through customer satisfaction and knowledge utilisation surveys, interviews with customers, partners and users, or focus group sessions). Indications for the quality ratings can also be recognised through revenues from diverse funding sources, repeat customers, partnerships with prominent knowledge institutions, participation in national/international research consortia and research networks, etc.

Societal and economic impact of the research

The second key question for the WR institute evaluation is:
What impact has the WR institute's research had in the evaluation period?

WR institutes can realise different types of impact with their research, with distinction between:
1. Type of knowledge user: business unitsinesses versus non-profit organisations including public sector
2. Type of domain in which impact is realised:
   - Contribution to the achievement of societal themes in national policy
   - Contribution to European or international policy agendas and themes
   - Contribution to innovation agendas of the Top Sectors in the Netherlands.

Viability of the organisation

The third key question about the WR institute evaluation is:
What is the viability of the institute? How well is the WR institute equipped and positioned for the future in light of developments in their specific environment?

4.2. Key criteria on a 4-point scale

Score	1	2	3	4
	Unsatisfactory	**Satisfactory**	**Good**	**Very good**
Quality	The group's research has clear weaknesses and is insufficiently appreciated by its stakeholders.	The group's research shows some weaknesses but is generally of good quality. The research is respected by most stakeholders.	The group conducts good and respected research for its stakeholders.	The group conducts very good and highly respected research for its stakeholders. The research is highly respected world-wide.
Impact	The group is insufficiently connected to its stakeholders. Also the utilisation of its research products is insufficient. The strategic importance for the economy (or policy-making / agenda setting) is minimal.	The group has good connections to stakeholders in general but falls short on some aspects. Also the utilisation of its research products is generally good but falls short in certain places. The strategic importance of this knowledge utilisation for the Dutch and European economy and/or resolution of societal challenges is generally substantial, but not in all respects.	The group has good and substantial connections with its stakeholders. Its research is used by its stakeholders. The utilisation of its research products has strategic influence on the economy (or policy-making and agenda setting) in the Netherlands and Europe and / or is of great use for challenges that society has to face nowadays.	The group has very strong structural connections to stakeholder groups. Its research products are used on a large scale. The utilisation of the research products is of great strategic importance for the economy (or policy-making and agenda setting) in the Netherlands and Europe and / or is of great use for challenges that society has to face nowadays.

Score	1	2	3	4
	Unsatisfactory	**Satisfactory**	**Good**	**Very good**
Viability	Group with significant weaknesses. Not well positioned and insufficiently equipped for the future. The strategy has clear deficiencies. Problem might be of internal (strategy, expertise) or external (market related) origin. Group is facing problems, caused by internal deficiencies. Management is responding not adequately. Decisions made on a rather ad hoc basis. Significant improvements are achievable.	The group has a good strategy in general but in certain parts there is room for improvement. The groups is generally well-positioned and well-equipped for the future, but shows some deficiencies. Not too innovative and not very competitive. In general the management do what is required and are not too exciting. Prerequisites for achieving good quality and impact in terms of finance and staff and facilities fall short on certain places.	Good group with strong focus and strategy and sufficient critical mass. Innovative and competitive. The group is well positioned and equipped for the future. The strategic plan is adequate and well thought out. It has not used all the opportunities yet and with a few adjustments its attractiveness will improve. Management is solid and stimulating. Nevertheless some improvements might be worthwhile considering in respect to finance, staff and / or facilities.	Very strong group with strong focus and strategy and sufficient critical mass. Very innovative and competitive. The group is very well positioned and equipped for the future. The institute is very attractive to its stakeholders. Good strong, proactive management. Decisions are correct and timely. The strategic plan is highly adequate and well-thought-out. Highly satisfied employees and staff. Prerequisites for optimal performance in terms of finance and staff and facilities are present.

4.3. Brief curricula vitae of the the assessment committee

An Michiels (chair)

Consultant and Advisor for AgTech / Independent director at AgKnowledge Partnering. In the past she was director of Keygene and worked as head of research at Syngenta, Limagrain and Bayer and has been member of the supervisory board of the Research Foundation Flanders.

Jean-Marie Aerts

Full professor in the faculty of Bioscience Engineering and department Chair of the Department of biosystems at KU Leuven. Has a good overview and knowledge in the field of robotics.

Angela Karp

Director and chief executive of Rothamsted Research. Prior to her appointment, she was the Director for Science Innovation, Engagement and Partnerships at Rothamsted. She has more than 35 years' experience in crop genetics and breeding for food and bio-renewables.

Isabel Roldan

Scientific Director of the Plant Sciences unit of ILVO (Research Institute for Agriculture, Fisheries and Food) and former professor at the Department of Plant Biotechnology and Bioinformatics of Ghent University. A plant geneticist with a background in molecular breeding, genomics and high-throughput plant phenotyping. For more than 25 years she has collaborated closely with breeders of different crops.

Monique van Vegchel

Policy officer at Plantum where she represents the interests of its members in research-oriented topics and focusses on new technologies in plant breeding. Monique has a master's degree in Plant Biotechnology from Wageningen University.

4.4. Programme site visit

Tuesday 13 June 2023

0830 Transfer to Wageningen Campus
0900 Welcome and opening of site visit
0930 Ambitions Wageningen Plant Research
1100 Internal reflection time for the committee
1145 Strategic personnel management
1230 Researchers career conversations
Lunch included
1400 Scientific and research quality including Statutory Research Tasks
1500 Internal reflection time for the committee
1545 Site visit Wageningen – NPEC and AgroFood Robotics facilities
1645 Relevance and impact of WPR
1730 Internal reflection time for the committee
1800 End of the day – transfer to the hotel
1900 Dinner with the committee
Hotel de Wereld, Wageningen

Wednesday 14 June 2023

0800 Transfer to Lelystad, business unitsiness unit Field Crops
0930 Welcome
0945 WPR and collaboration
1045 Site visit Lelystad; facilities and long term experiments
1200 Facilities and capabilities
1300 *Lunch*
1400 Transfer to Wageningen
1530 Stakeholder conversations
1700 Internal reflection time for the committee
1800 Key research in the spotlight
Dinner included
2000 End of the day – transfer to the hotel

Thursday 15 June 2023

0830 Transfer to Wageningen Campus
0900 Internal evaluation of committee, drafting report and presentation
1200 Presentation of preliminary results and conclusions
1300 Closing the site visit and lunch