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sYNGENTA AND Thought for Food: a Food-Security Innovation Platform

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Our mission is to inspire, empower, and incubate the next generation of innovators to tackle one of the biggest challenges facing our future.

Christine Gould, founder and chief executive officer of Thought for Food

Christine Gould, head of next-generation innovation and engagement at agribusiness company Syngenta Crop Protection AG (Syngenta), in Basel, Switzerland, smiled as she turned the pages of the Thought for Food (TFF) 2014–15 annual review. Gould had founded TFF in 2011 as a next-generation innovation platform for sustainable food and agriculture. In its first four years of operation, TFF had helped more than 5,000 university students generate viable business plans to address the vexing problem of feeding more than 9 billion people by 2050 (see Exhibit 1). At least 18 new student-led companies had been launched, and increasing numbers of professional mentors and support organizations were now joining the TFF global challenge and summit.

In 2015, Gould had to make a difficult decision: to either maintain TFF’s current status as an internal initiative at Syngenta or register it as an independent non-governmental organization (NGO). Syngenta had provided critical financial support as Gould had launched the TFF platform, and importantly, it had allowed her to allocate some of her working hours to the initiative. But now that TFF had reached the scale that required significant funding and a dedicated staff and leader, Gould wondered if it would be better to take the platform outside. Independent NGO status would enable the organization to raise funds from a wider base of supporters, but there was no guarantee that those funds would actually flow. Gould wondered if the enhanced flexibility outweighed the increased risk. She also wondered how senior Syngenta colleagues would view the move. They had encouraged her to keep TFF as an internal Syngenta initiative back in 2011, when she had been planning to leave the company as an entrepreneur focused on nurturing early-stage food and agriculture start-ups. Would they once again push her to maintain TFF’s inside status, now that the organization’s industry impact was growing but required additional resources?

TFF’s Origins

Gould launched TFF in 2011, convinced that next-generation innovation was the key to solving humanity’s most pressing food challenges. Her inspiration began when she studied for her master’s degree in agriculture system innovation at Columbia University, where her peers and colleagues were passionate advocates of openness, transparency, and cross-sector collaboration aimed at altering the agricultural status quo through innovative business models. Later, when she joined Syngenta, she found that these ideals sharply contrasted those of the policy makers and industry leaders she encountered in her work. The complexities of agricultural regulations and the need for large-scale solutions led most industry experts to believe that global food challenges would ultimately be solved through traditional product-based technology research done by incumbent firms with laboratories, scientists, legal teams, and other resources required to bring new ideas to market. For a firm like Syngenta to gain the approvals needed to launch a new active ingredient for crop protection, for example, it could take more than 10 years of research and legal processing, at a cost of US$280 million.[[1]](#footnote-1) It was hard for industry insiders to see how business-model innovations and low-tech solutions from outside the traditional systems could have an appreciable effect on global food production in the near future.

At the same time, Syngenta executives were sensitive to ongoing societal changes that posed risks to their traditional business model. For example, although investment in agricultural technology had been increasing rapidly in recent years, there was a troubling trend of growing public distrust of big agribusiness in general and of technological innovations in particular (see Exhibits 2 and 3). Technological agricultural innovation primarily took the form of chemical modifications to pesticides and other crop protectors, seed breeding using biotechnology and genetic methods, or cultivation of bio-pesticides, and all of these technologies were controversial in the eyes of the public. Regulators were increasingly recognizing public views on the wisdom of new product approvals, and public distrust represented the growing risk that some long-term innovation projects would never be commercialized. Most Syngenta leaders felt that public opinion about the need for traditional agricultural innovation and the benefits of these would align with those of industry if citizens had a realistic understanding of how modern food systems worked, and how much time and effort went into assuring the safety of new products before their release. Michael Kock, global head of intellectual property at Syngenta, pointed out the risks of weak public understanding: “People have a romantic view of how food security works and what it means to be an innovator. Many negative perceptions are based on a lack of understanding, which in the end limits an innovation’s potential to solve problems.”

A second worrisome trend for the industry was the changing work preferences of the millennial generation. University graduates increasingly chose to work in small- and medium-sized businesses or to launch their own entrepreneurial start-ups. Few young people entered the farming industry directly. According to Kock, in 2011, Syngenta could “already see that the way of attracting researchers in the past by offering lifelong employment and a secure income was no longer attractive for the next generation [which] wants to work on projects in an open environment and change companies every few years.” There were concerns that this trend could drive fundamental changes in the nature of future research. Some company leaders were looking for ways to explore possible future innovation scenarios.

Consequently, when Gould announced her plan to leave Syngenta and launch TFF as an entrepreneurial venture, senior colleagues encouraged her to launch it as an internal Syngenta project instead. Executives welcomed the opportunity to test new ways of speaking to young people and to gain perspective on youth employment needs and requirements. Gould was offered a newly created position, in the department of external affairs, dedicated to next-generation innovation and engagement (see Exhibit 4), and she was allocated a budget to support the first innovation challenge. Happy to have the freedom of an entrepreneur along with the structure and security of a corporate job, Gould agreed to the arrangement.

Launch and Early Growth

The first TFF Challenge was a simple event that invited university students to think deeply about global food challenges and how to address them. Company executives who attended the event were pleased to see young people gaining a deeper view of both agricultural realities and the complexities involved in finding solutions. What they did not expect was the depth of passion that the challenge evoked in these young enthusiasts and the resulting speed of TFF’s growth. Participants spread the news of TFF over digital and university networks, and the number of challenge participants grew significantly each year (see Exhibit 5). TFF and the winning teams from the annual challenge also attracted the attention of international media outlets like *Huffington Post, Forbes,* and *Fast Company*. TFF’s Facebook page had already accumulated more than 9,000 followers by 2014. In response to this growing visibility and enthusiasm, Gould continuously expanded the scope and professionalism of activities. By 2014, TFF had evolved into a multifaceted platform for cultivating and launching transformative food system innovations and building the human capacity needed to achieve that ambitious goal. The platform was uniquely designed to attract and empower the next generation of youth, who had the passion for a more sustainable world, the willingness to change the status quo, and the cutting-edge technological knowledge of digital natives. TFF made an impact through three key pillars: the TFF Challenge, an annual two-day summit, and its diverse global community.

The TFF Challenge

The TFF Challenge invited university students from all fields of study to generate prototypes for previously unseen solutions to the complex challenges of global food security. Applicants were invited to use online training resources to improve their ideas and develop business plans. Gould commented, “We expected to see bold and innovative technologies with the latest resources . . . [but] innovations are not enough. The projects had to be implementable, with serious scalability potential on a global level.” Applicants who made it onto the competition’s shortlist received individual coaching to cultivate entrepreneurial go-to-market skills. As such, the platform was instrumental in transforming students into innovative entrepreneurs, regardless of their final placements in the competition. Participants found the experience inspiring and transformational, and after four years, several had already succeeded in launching start-up businesses (see Exhibit 6). Max Loessl, co-founder of Agrilution GmbH (Agrilution), commented on the experience: “Before we got in touch with TFF, our team was just developing ideas around vertical farming and brainstorming about how to get involved in this new technology. TFF pushed us to make our idea more realistic and business oriented*.*” Gerald Perry, co-founder of FoPo Food Powder (FoPo), agreed: “TFF was the first single step for us to start our journey. [In response to] all the encouragements and pressures, we went to Philippines and tested our business plan.”

The Two-Day Annual TFF Summit

This second pillar brought together competing teams of students, entrepreneurs, investors, and thought leaders working in food, agriculture, innovation, entrepreneurship, and science. TFF summits had a stimulating and unique style that prompted participants to call them their “best event[s] personally and professionally.” In addition to the final competition, the program included inspirational talks from leaders at cutting-edge organizations like the XPRIZE Foundation, IDEO, and the Kirchner Impact Foundation. It also included skill-building sessions and learning games that explored innovation, impact, sustainability, and emerging technologies like precision agriculture, vertical farming, and synthetic biology. Participants were encouraged to learn and to make the most of networking opportunities.

The Diverse and Passionate TFF Global Community

TFF’s third pillar was a stable community of individual enthusiasts and organizations that were leading the search for agricultural innovations in their respective fields. TFF sought to pool the expertise of this group to solve problems that no single person, institution, community, or country could realistically conquer alone. Since next-generation innovation was an open, collaborative, experimental approach to finding solutions, the TFF community served the important role of assuring ongoingcollaborations among those who had initially engaged in competitions. Community members were committed to actively teaching and coaching one another and also to connecting and sharing resources.

Choosing the Path to Scale

By 2014, TFF’s rapid growth had made Gould and her colleagues question its long-term viability as an internal corporate initiative. The budget allocated by Syngenta had been increased each year to total $600,000 by 2014. This covered platform development costs and direct expenses for the annual challenge and summit; nevertheless, it was not sufficient to support a full-time dedicated staff, and this created a critical bottleneck in TFF’s development.

Taking TFF outside Syngenta would give Gould the flexibility to raise additional operating and investment funds from other individuals and institutions concerned about food security and agricultural innovation. Independent status would also make it easier for TFF to work with professionals who otherwise might fear conflicts of interest when collaborating on Syngenta-funded projects. Syngenta had always been hands off with TFF, allowing Gould to build without directly promoting Syngenta interests. Nevertheless, Gould saw a need to assure participants that TFF was not a public relations project for Syngenta, but rather a truly collaborative attempt to find food-security solutions. Independent NGO status would immediately resolve all of those concerns and support TFF’s evolution into a third-party platform, serving the interests of the entire industry. In fact, by serving the industry, TFF might offer even greater value to Syngenta. The entire agribusiness industry was gradually moving away from selling isolated products and toward selling integrated solutions. Gould’s colleague, Kock, had noted that Syngenta could “produce a building block for the solutions,” but could not produce solutions in their entirety. He saw a need “to collaborate with others by design in order to integrate the building blocks into a solution.” An independent TFF might have even more opportunities to safely explore new technologies and collaborative business models without immediately affecting core business activities.

On the other hand, the TFF competition and summit greatly benefitted from Syngenta’s commitment and industry-leading support, as well as from the personal time devoted by participating company leaders and professionals. Gould knew she could count on Syngenta’s continuing support for TFF if she took it outside, but if she wanted to appreciably grow TFF inside Syngenta, she would have to identify and demonstrate its tangible value for the firm. Until now, TFF had been housed in the external affairs department, where Gould worked. Nurturing relations with the millennial generation and a broader community of interested professionals clearly delivered value to external affairs. Moreover, Syngenta executives had been very pleased that TFF had provided more than the initially desired medium for delivering Syngenta’s views to the public. Indeed, TFF drove deep dialogues and two-way conversations among people with very different views. As Steve Maund, head of Syngenta’s global License-to-Operate platform, said, “I see value in talking to outsiders. If you have conversations only with those who agree with you, you don’t learn very much.”

Gould had regularly briefed Syngenta staff and executives about her insights on millennials, and the firm had recruited several TFF alumni. Clearly, TFF brought value to Syngenta’s human resource team. Maund noted an even broader contribution:

People want careers with purpose. If you can [connect people] and express the ideas [of working together on solutions] as TFF and we in License-to-Operate try to do, it brings meaning in itself. Corporations that engage in these types of activities will be much more attractive to the next generation of employees. . . . Some [TFFers] may develop a passion for innovation that lasts their entire life. They will study agriculture, go into research, or launch startups to work on agriculture innovation. Out of that process, real innovation will emerge.

Bangladeshi student Lamia Anwar Shama was a case in point. She noted, “When I started my undergrad as a business student, I thought I would become a banker. But after I participated in the TFF Challenge and won, I shifted my interests and ended up working in the agricultural sector.”

Nevertheless, until the innovations emerging from TFF could be incorporated into the company’s product innovation cycle, the business case for Syngenta would be difficult to assess. Despite repeated attempts by Gould and others, the goal of leveraging TFF had not yet been attained. As Juan Gonzalez Valero, Syngenta’s head of public policy and partnerships, pointed out,

There were real discussions about whether we could help some of these ideas to grow by incorporating them in our innovation cycles, but most ideas were not sufficiently developed to grow within an organization like Syngenta. We even looked at the possibility for joint sponsorship of some ideas, but that did not materialize either.

In practice, the TFF ideas that had gone to market up to this point were either low-tech improvements to existing food systems—primarily in developing economies—or modifications to agricultural business models like vertical farming.[[2]](#footnote-2) As a product-driven company, Syngenta struggled to see how business-model innovations could be of use. The seeds of some very interesting early-stage technology innovations had appeared in the TFF Challenge, but no one had been able to bring those ideas into Syngenta’s business activities or research labs, which of necessity had to focus on much more mature technologies.

A Future Within Syngenta?

With $13.4 billion in sales and more than 28,000 employees in 2015, Syngenta was a leader in agricultural innovation (see Exhibit 7). Approximately 10 per cent of its revenues were allocated to research and development each year, even in periods of market downturn, generating a very strong pipeline of products under development. Company leaders were deeply committed to sustainability, and Syngenta was one of four co-sponsors of the Vision 2050 project of the World Business Council for Sustainable Development (WBCSD). Former chief executive officer Michael Mack and Valero were key contributors to the WBCSD’s work of developing a blueprint for achieving the well-being of 9 billion people living within the limits of the planet.

In addition to this external collaborative work with other multinational corporations (MNCs), Syngenta executives were formulating ideas for an integrated company strategy that would transform the traditional culture and mindset from its previous narrow focus on objective science and technology innovation to a more comprehensive view of technology, serving the land and the people who worked it. In 2013, Syngenta announced its Good Growth Plan—a commitment to continuous improvement on six specific and measurable sources of value to society, including resource efficiency, ecosystem rejuvenation, and the strengthening of rural communities (see Exhibit 8). The engine for achieving these targets remained firmly rooted in product-based technological innovation. That model had served Syngenta well, and the firm had amassed critical skills and resources for maximizing its value. No one believed the fundamental business model should be altered, but there was a growing view that broader change was on the horizon and would require more vigilance than the company had needed in the past. Maund elaborated:

Gould and I tried to challenge the organization to think a bit more broadly than our traditional business model methods because both of us saw the need for our organization to evolve. You need your big machinery to scale and address a global market, but you also need the lean, mean fighting machines with the startup mentality to be sure that you avoid a Kodak moment of missing the new trends.

Robert Neill, Syngenta’s head of global product marketing, added,

The big value for me of TFF was preventing narrow-mindedness. The TFF teams came up with fantastic ideas that addressed a huge variety of opportunities. Maybe their particular ideas wouldn’t immediately make it to market, but they sure challenged you to think outside the box! It was very energizing.

As Maund observed, “There is a danger that in big companies we business-case new ideas to death. I recall a Silicon Valley speaker once saying that an innovation is unlikely to prove disruptive if it fits your current business model.”

Although she was happy to hear these supporting views, Gould questioned whether she could produce any measurable evidence of their validity. She was acutely aware that Syngenta, like most MNCs facing an ongoing global market slowdown, had in early 2014 launched a cost-cutting program intended to save $1 billion by 2018. In such an environment, she would have to develop tangible impact measurements to justify TFF’s growing space within the organization. Some scholars and consultants were beginning to develop metrics for the softer elements of sustainable business, such as employee and stakeholder engagement, but no standards had yet emerged. She certainly could not devote her time to that problem when so much other work was needed to maintain the momentum she had worked so hard to build with TFF.

An Independent Future?

Although independence would allow TFF to seek new funding sources, the work of securing the funds would put huge pressure on an already lean management team. Moreover, Gould needed to sharpen TFF’s value proposition for everyone involved. She had to articulate the value to financial sponsors and the value that would keep TFF community members actively participating over time. Of course, she also had to assure that there was value for new students so they would continue to enter the TFF Challenge each year. So far, students had been motivated by sheer passion for starting businesses and finding sustainable food systems and by the opportunity to experience the unique TFF Summit and be coached by experienced mentors. Of course, students also liked travelling to the summit, which was held in a different national capital each time.

If TFF were to have a real impact on food stability, moreover, Gould would have to further develop the potential of taking innovative ideas to market. Kock had noted, “TFF brings together students, industry, academics, startups, coaches and sponsors, but all of that is not so well orchestrated that you can say [TFF is] maximizing the potential for industry innovation.” The TFF Challenge and Summit did a great job of kick-starting the go-to-market process, but sustained and continuous investments of professional time and money would be needed to fully nurture most of the TFF Challenge ideas. Building the TFF community into a formal incubator or accelerator might be one path to follow. Gould wondered what additional resources and activities she would have to employ to realize that type of solution.

A very different possibility would be to reorient the TFF Challenge so that it was no longer strictly a student competition, but a public incentive prize challenge instead, like the XPrize, which offered large, crowd-sourced financial rewards to anyone who could provide answers. Gould knew such approaches had been used to generate late-stage prototypes to specific information technology and engineering challenges, but it wasn’t clear that they could generate viable ideas to address a broader challenge like ensuring global food security. In her view, these approaches had another more serious flaw: they had little potential to cultivate the dedicated community of next-generation innovators that she and other TFF mentors were so passionate about.

Edward Silva, executive director of TFF, commented on this community:

The communities that support incentive prize competitions are often an undervalued asset. They bring diversity that boosts the potential for creative interaction. It is clear from TFF summits that out-of-the box solutions—those that really push the edge of the envelope—happen when food and agriculture intersect with other fields.

In his view, large open challenges were unlikely to really push the edge. He therefore favoured small incentive prize competitions focused on issues like vertical farming or open data, conducted in partnership with other organizations seeking insight, ideas, and talent.

It seemed that, no matter what path TFF followed, there was work to be done. TFF had been successful so far in building interest and an understanding of global food challenges, nurturing ideas to resolve those challenges, and building the human capacity to put the ideas into action. With the right boost in resources and the right shift in focus, TFF could continue on that accelerated path. As she pondered the next moves, Gould realized that much was at stake.

Exhibit 1: The Challenge of Feeding over 9 billion people by 2050

In a presentation at the 2016 TFF Summit in Zurich, scientist and agriculture change agent Mike Gould pointed out the following information:

For 10,000 years, agriculture was sustainable. Productivity was low, but the population was small (less than 2 billion before 1900) and resources were plentiful. However, in the 20th century, the human population increased at an unprecedented rate, reaching to more than 6 billion by 2000. New technologies bring dramatic increases in agricultural production but also require massive inputs of non-renewable energy, water, and chemicals. This model is not sustainable as the world population is expected to reach 9 billion by 2050. This means we need to produce as much food as the entire human population has produced in the past 10,000 years.

As we are already using nearly all the farmable land on the planet and 70% of the earth’s fresh water, we need to find new, more sustainable agricultural technologies that provide very high productivity but require lower input of arable land, fresh water, and fertilizers.

Compounding the problems of population growth and natural resource limits noted by Gould in his 2016 speech, modern agricultural systems were stressed in the 20th century by a rapidly growing demand for protein. As poverty declined, new middle-class families switched from plant- to meat-based sources of protein. Since livestock farming was more resource intensive (e.g., in terms of feed, water, and land) and emitted more carbon than crop farming, planetary systems underwent a double hit as the population swelled.

The poverty and low education levels of smallholder farmers posed another major challenge. In a short-sighted drive to boost crop yields and incomes, uneducated farmers overused pesticides and fertilizers, eventually triggering runoff that contaminated water and soil resources for future use. Smallholders also under-invested in safety precautions, leading to injuries and toxic exposures. Finally, the search for income growth drove younger generations of farming families off the farm and into the cities for jobs and education. Farm communities faced potential collapse or extinction, as the pool of skilled labour declined.

Source: Case authors; Mike Gould, “Food 3.0” (presentation, TFF Summit, Zurich, SW, 2016).

Exhibit 2: Agricultural Technology Investment, 2010–2015 (in US$)

Source: Arne Duss and Jonah Kolb, “Beyond the Hype: How Agriculture Technology Wins Customers and Creates Value,” (HighPath Consulting, Inc. and Moor & Warner Ag Group, LLC, 2016), 1, accessed July 13, 2016, <https://research.agfundernews.com/moorewarner/agtech-beyond-the-hype.pdf>.

Exhibit 3: Public Attitudes toward Agricultural technologies

Note: US = United States; UK = United Kingdom; GMO = genetically modified organism.

Source: Syngenta, *The Agricultural Disconnect: Global Research Report*, 11, accessed September 25, 2018, https://www.syngenta.com/~/media/Files/S/Syngenta/documents/agricultural-disconnect.pdf.

Exhibit 4: Syngenta Organizational Chart

Note: CEO = chief executive officer; COO = chief operating officer; HR = human resources; R&D = research and development.

Source: Created by authors based on information supplied by Christine Gould.

Exhibit 5: Thought for food’s Growth, 2011–2014

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **2011** | **2012** | **2013** | **2014** |
| **Students Involved** | 50 | 250 | 1,145 | 1,300 |
| **Universities** | 10 | 13 | 66 | 300 |
| **Ideas Generated** | ❖100 | ★50 | ★160 | ★336 |
| **Summit Participants** | NA | 50 | 253 | 380 |
| **Mentors/Advisors** | 1 | 6 | 41 | 20 |
| **Supporting Organizations** | 4 | 7 | 18 | 20 |
| **Facebook Followers** | 1,200 | 4,000 | 7,000 | 9,100 |

Note: ❖ = awareness campaigns; ★ = business ideas; NA = not applicable.

Source: Thought for Food, *2014 Annual Review*, 29, accessed November 16, 2018, http://tffchallenge-production.s3.amazonaws.com/annual\_report/2014%20Annual%20Report%20-%20Digital%20Version%20LR.pdf.

Exhibit 6: Business Start-ups Born From thought for food

|  |  |  |
| --- | --- | --- |
| Company | Concept | Brief |
| Agrilution | Automated kitchen device that allows home food growing | Agrilution developed, produced and distributed a fully automated kitchen device, called plantCube, which allowed customers to harvest lettuce, herbs, and other leafy greens in their own homes, right before eating. The small-scale multi-layered device could reduce water consumption by up to 98 per cent and fertilizer consumption by up to 60 per cent compared with traditional agriculture. |
| InnoVision | Low-tech solar-powered, microclimate chambers | InnoVision provided low-tech, solar-powered microclimate chambers to small-scale farmers in Bangladesh, where the current alternative was dangerous chemicals. Portable and made of locally sourced materials, the chambers used an evaporation cooling system to increase the shelf life of fruits and vegetables. |
| FoPo | Food powder to prolong fruit’s shelf life | FoPo was a food powder made from freeze-dried fruits, which would otherwise be wasted. Due to the freeze-drying process, fruits were dehydrated into a concentrated form of very fine, highly soluble powder with a prolonged shelf life from two weeks to two years. Application of this drying technique retained 90 per cent of the nutritional content of fresh produce. |

Source: Case authors.

Exhibit 7: Syngenta Financial Performance

**Income Statements, 2012–2015 (in US$ million, except per-share amounts)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **2015** | **2014** | **2013** | **2012** |
| Sales | 13,411 | 15,134 | 14,688 | 14,202 |
| Cost of Goods Sold | −7,042 | −8,192 | −7,986 | −7,223 |
| Gross Profit | 6,369 | 6,942 | 6,702 | 6,979 |
| Marketing and Distribution | −2,210 | −2,497 | −2,394 | *−*2,423 |
| Research and Development | −1,362 | −1,430 | −1,376 | −1,257 |
| General and Administrative |  |  |  |  |
| Restructuring | −388 | −193 | −179 | −258 |
| Other General and Administrative | −568 | −717 | −667 | −785 |
| Operating Income | 1,841 | 2,105 | 2,086 | 2,256 |
| Income from Associates and JVs | 7 | 7 | 48 | 7 |
| Financial Expense, Net | −256 | −217 | −200 | −147 |
| Income before Taxes | 1,592 | 1,895 | 1,934 | 2,116 |
| Income Tax Expense | −248 | −273 | −285 | −266 |
| Net Income | 1,344 | 1,622 | 1,649 | 1,850 |
| Diluted Earnings per Share | 14.52 | 17.60 | 17.78 | 20.05 |

Sales by Product Line, 2012–2015 (in US$ million)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **2015** | **2014** | **2013** | **2012** |
| Selective Herbicides | 2,894 | 3,083 | 3,051 | 2,939 |
| Non-selective Herbicides | 913 | 1,445 | 1,545 | 1,246 |
| Fungicides | 3,357 | 3,518 | 3,035 | 3,044 |
| Insecticides | 1,705 | 2,066 | 1,912 | 1,841 |
| Seedcare | 994 | 1,115 | 1,228 | 1,107 |
| Other Crop Protection | 142 | 154 | 152 | 141 |
| Total Crop Protection | 10,005 | 11,381 | 10,923 | 10,318 |
| Corn and Soybean | 1,564 | 1,665 | 1,654 | 1,836 |
| Diverse Field Crops | 658 | 827 | 842 | 719 |
| Vegetables | 616 | 663 | 708 | 682 |
| Total Seeds | 2,838 | 3,155 | 3,204 | 3,237 |
| *Elimination of Crop Protection Sales to Seeds* | *−80* | *−95* | *−130* | *−110* |
| Lawn and Garden | 648 | 693 | 691 | 757 |
| Group Sales | 13,411 | 15,134 | 14,688 | 14,202 |

Note: JV = joint venture.

Source: Created by case authors based on Syngenta, *Annual Report 2012,* accessed September 25, 2018, https://www.syngenta.com/site-services/corporate-publications/annual-reports; Syngenta, *Annual Report 2013,* accessed September 25, 2018, https://www.syngenta.com/site-services/corporate-publications/annual-reports; Syngenta, *Annual Report 2014,* accessed September 25, 2018, https://www.syngenta.com/site-services/corporate-publications/annual-reports; Syngenta, *Annual Report 2015,* accessed September 25, 2018, https://www.syngenta.com/site-services/corporate-publications/annual-reports.

Exhibit 8: Syngenta Good Growth Plan Targets for 2020

|  |  |  |
| --- | --- | --- |
| **Make Crops More Efficient** | **Rescue More Farmland** | **Help Biodiversity Flourish** |
| Increase the average productivity of the world’s major crops by 20 per cent without using more land, water, or inputs. | Improve the fertility of 10 million hectares of farmland on the brink of degradation. | Enhance biodiversity on 5 million hectares of farmland. |
| **Empower Smallholders** | **Help People Stay Safe** | **Look After Every Worker** |
| Reach 20 million smallholders and enable them to increase productivity by 50 per cent. | Train 20 million farm workers on labour safety, especially in developing countries. | Strive for fair labour conditions throughout our entire supply chain network. |

Source: Created by authors based on “The Good Growth Plan,” Syngenta, accessed September 28, 2018, <http://www4.syngenta.com/what-we-do/the-good-growth-plan>.

1. All currency amounts are in US$ unless otherwise specified. [↑](#footnote-ref-1)
2. Vertical farms were indoor facilities, typically located in abandoned factories and warehouses in urban centres. Fresh greens were grown in vertically stacked trays under the glow of light emitting diode (or LED) lamps, with the support of water circulation or misting systems that recycled water without generating waste. By 2016, commercially successful vertical farms were limited to producing fresh greens. Experiments were underway to expand the range of crops to include more vegetable varieties. Staple crops like wheat, corn, rice, or maize did not seem feasible for the near future. [↑](#footnote-ref-2)