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Editorial #7, 2025. Plant Intelligence – Towards a Vegetal Aesthetics

Aesthetics
Artistic Research
Matter/Materiality
More-than-Human
New Materialism
Plant Intelligence
Plasticity
Speculation

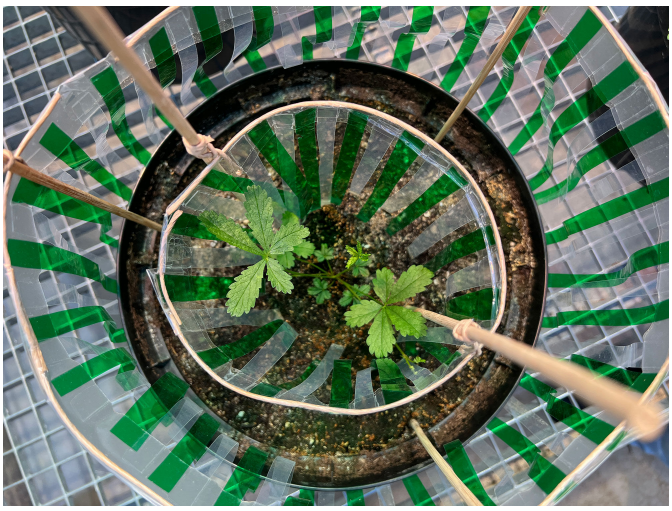

ABB. 1–2
Creeping cinquefoil in a competition experiment, Botanical Garden of the University Tübingen

This issue of INSERT was created within the framework of the research project *Plants_Intelligence. Learning Like a Plant*.[1] It brings together current interdisciplinary discourses on plant intelligence from the perspective of aesthetic theory and practice. Employing the means of art and art theory and in close exchange with scientific, everyday cultural, traditional, and spiritual methods, plants are explored, dominant notions about them are called into question and alternative concepts of plant modes of existence are brought into play. Artists, philosophers, Indigenous media activists, art and media theorists, as well as biologists seek modes of articulation, media, methods, and traditions that view plants as sensing, acting, flexible—intelligent—beings. How do they research plant forms of perception and making of worlds, and how do they relate to them? How could an adequate plant aesthetics be formulated if we define it as something that is closely connected to the way plants exist and behave?

To speak about plants from an aesthetic perspective usually means understanding them as elements that beautify human life. Plants are then merely flowers, adornments, decorations—servants to humans, or at best, playmates of bees, bumblebees or butterflies who are lured in by their peculiar colors, shapes and patterns or sweet scents. Conceived less aesthetically, plants—if they are even noticed—are mostly just a resource, biomass for cows, humans, cars. No one is interested in the magic of blooming meadows or in Robin Wall Kimmerer's question: "Why do goldenrod and asters look so beautiful together?"—a question she asked at the outset of her career as a botanist, for which she was reprimanded by her professor, since beauty was considered the concern of art, not of science.[2] Yet even Darwin asserted that beauty was a key factor in sexual selection and evolution. In the case of the goldenrod and asters, it is the strong color contrast between yellow and violet that makes the two species highly visible to pollinators.

But the beauty of plants is not at issue here. Instead, it is about their capacities, their behavior—their intelligence—and what their recognition implies for artistic questions and the formulation of an aesthetics of the vegetal. Here, the aesthetic or aesthetic-vegetal perspective is at first meant in the sense of *aisthesis* 1) the sensual and sensory and its perception; 2) the forms, strategies and methods that humans and plants develop and apply in relation to each other; and 3) the theory-practice of this. It investigates, using theoretical and artistic methods, how artistic artifacts or vegetal processes are produced so that they look/sound/smell/feel the way they do.

Acts of growing/not growing/withering and gardening are also read as strategies of shaping, forming and experimenting, and therefore as the expression and gathering of the aesthetic and intelligent action of more-than-human actors. The sensual-sensory of *aisthesis* is understood beyond the phenomenological in a fundamentally existential, political and "ethical-aesthetic" sense. What Félix Guattari means with this is that the aesthetic is ethical and empowering, that forces to change the status quo are mobilized through affects that can be triggered by micropolitical, sensory aesthetic practices.[3] Building on this, plants are understood as assemblages of physical and chemical materialities, forces and efficacies. They are actors in ecological concatenations and relational events. As such, they are situational, responsive and active. They distinguish themselves from animal modes of making worlds, while also being affiliated with them and with us.

The interdisciplinary discourse on plant intelligence has been conducted for about 15 years at the fringes of botany, neurosciences, philosophy, and art.[4] Scientific research can now prove what has been known to alternative and in part also to traditional plant knowledge for a long time, namely, that plants are more complex beings than has hitherto been assumed. They are open to the world, perceive it sensually, respond to and alter it; they communicate, coordinate and cooperate with various actors; they make decisions, solve problems, play. They are capable of action, learning and flexibility. In short, they are intelligent: For the aforementioned traits are defined by many scientists, despite ideological and disciplinary differences, as fundamental characteristics of intelligent behavior, be it in bacteria, humans, fungi, machines, or plants.[5]

Focusing on plants and their intelligence means becoming attentive to our neglected closest companions, opening up other encounters as models and seeking ways out of an understanding of the world that is based on ignorance and exploitation. Since Natasha Myers formulated the concept of the "Planthroposcene"[6] as a vision, not only have plants and fungi become important protagonists in everyday practices, art and theory, but the question of their abilities has also become relevant.[7] This is accompanied by an increasing interest in religious, spiritual and Indigenous practices, especially because the latter respect and venerate plants.

Plants and their powers have also played an eminent role in Western history, (natural) medicine and the Christian religion—yet they were not integrated into dominant modes of thought, and their healing powers were, in the course of modernization, quite literally synthesized and atomized. Giovanni Aloi rightly criticizes the allegorical function of plants and their attendant de-materialization in Christianity.[8] Their material powers have remained present all the same: the thorns that pierce the head of Jesus; the palm fronds with which he is greeted and accompanied; even today, as Julia Mensch observed in the course of her research, the streets in rural areas of Argentina are decorated with colorful plants such as amaranth to celebrate the resurrection at Easter. Although the vegetal metaphors and allegories that are still so prevalent in Western thought today promote the disembodiment of plants and subvert their right to exist, the bodies of plants can never be entirely banished: They are present, even if they are not present for many people.

Whether and how plants and their abilities are perceived is a question of culture, of the politically negotiated values in that culture and the significance of imagination: Does the respective culture take other-than-human behavior seriously and has it developed practices and rituals that are attentive to them? Does it make use of their abilities and if so, how? Does it sense the involved forces and actors and show gratitude towards them or can it only deal with them in an extractivist and industrially commodified manner? The approach of our research partner Monika Messmer at the Research Institute of Organic Agriculture (FiBL) demonstrates that respect is also possible in agriculture and breeding, especially in organic farming. She understands and practices breeding as "co-evolution" and "conversation" between humans and plants and, as is demonstrated in her more recent programs, also with bacteria;[9] and this is done in explicit contrast to conventional ideas and methods in which breeding is understood as human manipulation of biomass. The close collaboration of the breeders with plants, soil, bacteria, and farmers at the FiBL stands in clear contrast to the control scenarios of *smart farming*, which Noelia Billi highlights in her contribution. Advertising images show farmers sitting in their living rooms in front of their computers, controlling and manipulating the natural world outside.

The assertion of plant intelligence and the necessity of its aesthetic reformulations are thus also understood here as queer-feminist and decolonizing, seeking to change our dominant culture. It opposes well-known nature/culture hierarchizations with which capitalism until today secures resources and power: In them, plant modes of being, as the epitome of 'lower' matter and 'nature,' have always been exposed to disregard, non-recognition and discrimination and are open to exploitation by 'higher,' 'intelligent' beings. Intelligence is generally used quite unquestionably for human and human-like animals and their machines; but once detached from humans as the possessors of intelligence, it is no longer that clear what intelligence really is. The fact that plants possess complex abilities is today no longer contested and

can be scientifically proven. The point of contention is merely the question of how these abilities are interpreted and whether one should call them intelligent. Our research partners in the field of botany do not work with the concept of intelligence themselves. For them, these questions are a philosophical issue.[10] In this respect, a speculative and imaginary moment always comes into play when asserting plant intelligence.

An important approach for the overall project was the hypothesis that, contrary to the current hype surrounding AI, there are much older, tried and tested, ecological and open forms of intelligence in plants and their companions; and that, when one knows how to read them, one can learn quite a bit in terms of leading a life. However, at the beginning of the project, it was not clear whether one can really speak of plant intelligence, whether that is not too speculative and overrated and even epistemologically and politically counterproductive with this biased focus on intelligibility. Through the engagement with Critical Plant Studies and the conversations we had with the most various plant experts during the course of the project, as well as through our own experiments, this point was clarified: In fact, the concept of intelligence can, indeed must—for political reasons—also be extended to non-human beings and non-machines. Because intelligence, as I will explain, does not stop at the boundaries of the species.

This project understands itself as political in that it seeks to reclaim aspects of life expropriated by neoliberalism and allow them to be experienced as fundamental qualities of relational existence: Concepts such as attention, flexibility, learning, and growing have been economized, perverted and employed against the well-being of individuals.

What is plant intelligence?

Scientists such as the molecular biologist Anthony Trewavas, one of the first proponents of plant intelligence, the neuroscientist and philosopher Paco Calvo and our research partner, the botanist Katja Tielbörger, situate plant intelligence on the level of so-called individual behavior in the life cycle of plants. In their view, a plant's intelligence is not inscribed phylogenetically as a fixed program, it instead articulates itself as an activatable capacity for complex action in the life of one or more actors. For Paco Calvo, the question of intelligence must first be posed universally: "We don't want a definition of plant intelligence. We want a definition of intelligence. Because otherwise it looks as if we were looking for a definition that applies specifically to plants."[11]

A basic marker of intelligence is proactive (and not reactive), globally flexible and systemic action: "It means that the individual not only behaves adaptively. We know adaptations are needed. But it means that on top of behaving adaptively, you behave in a manner that is sufficiently flexible to deal with contingencies. [...] a behavior that is not reactive, that is not only in response to

the environment, but that is proactive and anticipatorily [...] it is systemic: integrating all informational channels."[12]

Plants reveal all of these traits, and they can also be proven in experiments: "Intelligence is not simply a response to light, or the response to nutrients or a response to a chemical, to a toxic chemical, so it's the integrated systemic response to everything. To put it this way: in one context, it might pay off, in another not. My concern is that we treat plants as toy cartoon examples, as if a plant was simply doing... with a very reduced environment, like phototropic behavior—light. No, we need to think that the environment of plants is complex. It's very sophisticated. And they need to find their trade offs because their responses don't just need to be proactive. They need to be globally proactive. And globally means dealing with many sources and many sorts of uncertainty. So, uncertainty about many different things: enemies, toxins, light conditions, nutrient, many different things are impinging on the plant. So it's not just to be proactive. It's to be proactive at the systemic global scale."[13]

Although intelligence, for Paco Calvo, is more than mere adaptation to the environment and cannot be a question of hierarchically conceived degrees, he defines the boundaries of specific intelligences based on the boundaries of the respective environments/worlds: "We usually like to say that it comes in degrees, but it's not a question of coming in degrees, because if we've said that it comes in degrees, we could be assuming that there is lower and higher intelligence. And it's not a matter of lower versus higher. It's a matter of different types, different intelligences. So, different ways of being globally adaptive as a behaving, organizing with respect to the environment. Bacteria are not less intelligent than *homo sapiens*. They are simply exhibiting the type of intelligence that the environment requires from them."[14]

The fact that the environment is now mentioned here as a co-producer of specific intelligences appears less as a contradiction than as an attempt to place emphasis on the dependence of intelligent behavior on matter and the interactions with it, while simultaneously avoiding a deterministic approach.

What are the specific environment-related challenges for plants? Often, reference is made to their being exposed, their openness and sedentarism—plants can't run away. This is why, for example, they have a particularly large number of senses spread over their surface with which they register stimuli; they process and coordinate them within their own structure (upper leaves, for example, can behave differently than lower leaves, etc.) or they send signals to their neighbors to warn them of predators and to protect themselves. Or they make use of distributed agency: It is now well documented that trees enter into symbioses with fungi, so-called mycorrhizae, so as to improve their nutrient uptake and drought resistance; however, the popularized assumption that trees qua fungi help other trees and plants is not scientifically proven.[15]

Owing to their modular structure, plants can also enlarge body parts, for example, leaves that receive too little light, or let them die off, like roots that do not get enough nutrients. Or they develop forms of mimicry to become invisible to enemies. This creative ability, which the respective individuals use in the course of their life cycle to adapt to the respective environment, is known in biology as phenotypic plasticity. In principle, all living beings have a plastic ability, at least in certain body parts, but plants very distinctively. The use of this ability for self-formation is not purely automatic or reactive; rather, it can be understood as intentional behavior. Anthony Trewavas writes: "Thus, a simple definition of plant intelligence can be coined as *adaptively variable growth and development during the lifetime of the individual*."[16]

The manner of individual growth (not growth itself, but the ability to adapt) is an expression of intelligence.[17] Thus, growth and adaptation processes, respectively, are not solely genetically predetermined or automatic; rather, they are actively shaped through coordinated cellular interactions.

As an example, I would like to mention an experiment conducted by Katja Tielbörger. She and her team used three different scenarios in an attempt to find out whether plants can adapt their appearance to the size and density of their competitors, since plants try to avoid shade and grow toward the light. In one case, the cinquefoil grew upward, in the other it formed large leaves and in the third it produced lateral runners. According to Tielbörger, the plants were therefore able to "'make decisions'—a term, by the way, that was a thorn in the side of one of the reviewers of our manuscript."[18]

Whether the plants could situationally 'decide,' as Tielbörger interprets it, or whether the respective reactions are not indeed inscribed in the genetic program to avoid shade, at first appeared uncertain to me. But despite all ambivalence, the fact remains that the different individuals did not simply grow upward but 'recognized' the difference of the respective situations and behaved proactively.

If one does not simply reject intelligent behavior, one can indeed discern vegetal calculation and processing in the example described above. This does not take place rationally via the brain, but physically: Materialities come together with other materialities under very specific conditions and allow contingencies or 'decisions' to occur in this way and no other.[19] These contingencies/events/decisions occur based on material-specific interactions of certain actors. Brainlessly, but physically coded signals are sent. The body takes over the thinking-acting, or rather, thinking is body-action—humans are also familiar with this from themselves. These 'decisions' can be material effects of interacting agents or quasi-automatic re-actions or pro-actions based on prior experiences/training.[20] On which level and however one interprets this: There are moments in which sensing, processing, deciding, and creative acting takes place.

For the philosopher Michael Marder and the biologist André Geremia Parise, this processing is a cognitive act, because cognition is not bound to a brain, but "could be defined as the process whereby organisms perceive, process, and use information usually to keep their homeostasis in balance and increase their chances of survival."[21] Plants constantly expand into their environment and form a unity with their milieu, so that the demarcation between plant and environment basically makes no sense.[22] According to Marder, their intelligibility, in a critical reformulation of the Cartesian principle, must be situated exactly in this constant self-expanding and connecting with others (and other milieus).[23] To put it differently: Intelligence, plant intelligence, would be nothing without its materiality, relationality and processuality—and that worked and continues to work without humans and machines.

Paco Calvo explains the fact that bacteria, for example, have not been recognized as intelligent beings by the fact that they fall outside the frame of reference of human communication systems. For him, bacteria are intelligent because of their embeddedness in the environment, while computer-based language models are not intelligent; they are merely syntax. Here, one could object that "[i]n humans as well, intelligence is nothing other than data processing of the present against the background of lessons from the past. The better the learning algorithm and the better the data interpretation, the more intelligent you are."[24]

This information-theoretical approach machinizes nature: Intelligence is based on feedback loops, sensing is measuring, and patterns can be recognized using algorithms. Researchers like Paco Calvo reject this. With reference to the intelligibility of matter, moments come into play that can no longer be captured by algorithms.[25] Paco Calvo even argues that there are no algorithms in nature—that they are merely constructs: mathematical calculations by which we attempt to comprehend natural phenomena, but which are not nature itself. A "biogenic" (Calvo), neo-materialist, or, as in Marder's case, phenomenological approach to plant intelligence thus leads to a critique of the information-theoretic model and its definition of intelligence from an unexpected direction;[26] unexpected, because these body-related approaches do not appear to completely abandon the information-theoretical model, as suggested by references to the importance of information processing for cognition, etc.

But perhaps information processing also needs to be conceived differently again. Etymology provides an answer. Intelligence comes from the Latin *inter-legere* and means 'to read between,' 'to choose between.' While Florianne Koechlin and others translate this with "to choose between two (options),"[27] which is a binary decision, I am interested in the in-between: Being intelligent then means to read relationality, to synthesize things. That too is processing, albeit processing that takes place beyond binary decision-making.

Directions of vegetal aesthetics

All contributions brought together here point to directions and possibilities of how one can aesthetically approach plants as living, intentional and cognizing beings—in short, the intelligence of plants—and thus realize the difficulties in unifying this pluriversal, contradictory and speculative topic, as it were. These difficulties already show themselves in the composition of the overall project. Both the artistic researchers Felipe Castelblanco, Julia Mensch, Rasa Smite and our research partners Ayênan John Quinchoa Juajibioy and Ursula Damm and I as an art theorist take entirely different approaches. However, it is not only the aesthetic-artistic methods that are divergent, but also the plants and their methods. They are all designers whose different prerequisites and interests need to be made transparent.

Perhaps for precisely this reason, Giovanni Aloi is cautious in the interview for this issue in regard to formulating a vegetal aesthetics: "Throughout time, artists have explored different aesthetics to engage with plants. Some of these have become more iconic than others."[28] The special as well as typical feature of artistic-aesthetic practices—and of art in general—lies in being specific, personal and singular. In this regard, they are similar to forms of plant life, whose special feature is that they live in ecologically specific places or adapt to a certain degree to the new specifications under changing conditions, reshaping them to suit their needs or disappearing. Yet while this tendency toward the specific as a subjective approach is what one usually appreciates with artists, plants are generally denied any kind of peculiarity and individuality. In the best case, one focuses on their interacting, collective and cooperative capacity: Instead of acknowledging their singular being, plants become cross-species swarm beings, rhizomes that hint at alternative subject theories and vegetal forms of political agency. As important as desubjectivizing notions of collective action are, the danger that plants will again be disembodied and allegorized lurks everywhere.

And how can one speak about what is typical of plants—the fact that they grow—without stereotyping it? Maybe by defining this behavior as following intelligent—and also creative—strategies. Their material engagement with and connection to their environment, their processing of and adaptation to predictable and unpredictable situations, their radical openness and flexibility, their intentional growing/non-growing or dying and decaying as well as their abilities to coordinate, cooperate and form alliances, their mobilizing of forces, their transforming of energies, their influence on and changing of others, and, last but not least, their connecting of the elements: These are aesthetic processes and materializations that provide the basis for a more-than-human vegetal aesthetics.

An open catalog of features of aesthetic abilities and thus of a vegetal aesthetics can be an attempt to understand, acknowledge and further develop the ontology of plants in terms of media and material aesthetics—to tear plants

out of their fixed role as an invisible, silent background or decoration for humans. These are attempts to propose vegetal strategies of wanting-to-live, of co-habiting, of shaping and transforming as a more-than-human common cause. As aesthetic methods of world-changing that must be specifically shaped time and again.

Preview

An aesthetics of the vegetal, i.e., an aesthetics of vegetal intelligence, must take into consideration the material, relational, creative, and sessile ontology of plants. Giovanni Aloi, for example, emphasizes that the modes of life of plants are good examples of the "weird ontologies" propagated by speculative realism: Plants reveal forms of becoming that often unfold beyond human perception. It is important to develop accesses that do justice to their "opacity." For this reason, he calls for speculative approaches that open our imagination and acceptance to the non-normalized.

An aesthetics of vegetal intelligence would than always also be an aesthetics of opacity and of the alien. Cate Sandilands realizes such an aesthetics in the form of *Nature Writing*. Her poem *Forest. Suite for the Anthropocene* was initially composed as a haibun—a poetic-essayistic short form. The starting situation: "A misty evening in March in the forest." The narrator inhales and exhales, she smells the typical scent of earth after rain, for which there is even a scientific designation. "I love the word, petrichor." It remains open what she loves more: the word, the concept or this scent. At any rate, "petrichor," just like the various sounds and symbioses she tells of, draws us into the molecular materialities as well as the literally and graphically opaque events called "forest." Cate Sandilands describes her contribution as a "suite," as she also poetically 'adapted' the abstract and keywords in a free interpretation of the editorial guidelines.

Matthew Fuller's contribution, *Days Are as Grass. On Karel Miler's "Felt by Fresh Grass," Plant Intelligence and Expanded Aesthetics*, also deals with the aesthetics of material sensing, decidedly formulated as a more-than-human aesthetics. Based on his re-reading of Karel Miler's performance inspired by Critical Plant Studies, he makes it comprehensible how sentient beings come together in an aesthetic act and decolonize dominant modes of perception.

The role that technical sensors, aesthetic image politics, plants, humans, and algorithms play in the production of seemingly intelligent plantation economies is examined by Noelia Billia in her contribution *Open-Air Laboratory: An Approach from Plant Aesthetics*. She analyzes the way in which large-scale experiments with smart farming are being conducted in the vast soybean monocultures of Argentina, opening a new chapter in distributed cognitive systems.

Julia Mensch also engages with the effects of the extractivist model in Argentina. In the frame of *Plants_Intelligence*, she uses extensive field studies, interviews with experts and personal gardening practices in urban space and observations in drawing to follow the strategies of amarant that can resist the tons of regular pesticide spraying. In her contribution *Aroma Colorado*, she describes its astounding plasticity in detail.

The contribution *Dividual Interweavements, Linguistically and Algorithmically Staged* combines Ursula Damm's observations and calculations regarding the mode of life of lichens with the thoughts of the philosopher Michaela Ott. It reads the cross-species symbiosis of lichen as a paradigmatic model of ecological subjectivization: As materially interacting forms of becoming/participation/cognition, the lichens articulate the intelligibility of all life.

Rasa Smite's contribution *AI Herbarium. Flowering Plants as Inventors of Their Own Existence* understands plant intelligence as an evolutionary force. Following her artistic experiments at FiBL on the plasticity of white lupins, she worked together with evolutionary biologists and her co-author Raitis Smits to develop animations that simulate the evolution of lupins. The outcome consists in morphologies and color combinations that highlight the formal openness of this flowering plant, which is several million years old.

The contribution *Jajañe—Chagra—Garden* describes, from three perspectives, how Indigenous gardening is conducted as the gathering of cross-species forms of knowledge and intelligence. In Felipe Castelblanco's essay *La Chagra de la Vida—Plant Intelligence as Becomings*, the *chagras*, meaning gardens, are part of a cultural approach to caring for the rainforest and its powers. The conversation *Sëntyöyiÿna Betiyëngaca. Walking with Plants* between the biologist Natalia Uribe Macías and our research partner Ayênan John Quinchoa Juajibioy shows how vulnerable traditional human-plant relations are in the Colombian rainforest, especially given that plant knowledge is passed down orally and across generations.

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NOTES

1 *Plants_Intelligence. Learning Like a Plant* (2022–2025) is funded by the Swiss National Science Foundation and based at the Institute Art Gender Nature, Basel Academy of Art and Design FHNW. The project team includes Yvonne Volkart, Felipe Castelblanco, Julia Mensch, and Rasa Smite. Further information: http://plants-intelligence.ch
2 Cornman 2025.
3 See Guattari 1995 and 1996. For a further development of the concept see Fuller/Goriunova 2019.
4 In addition to scientific experiments, so-called Critical Plant Studies have become academically established in the humanities. Among its representatives are Giovanni Aloi, Matthew Fuller, and Cate Sandilands, who have contributed to this issue of INSERT. See Stobbe 2019.
5 See Marder/Parise 2024; Koechlin 2024; Schlanger 2024; Calvo 2022; Khattar/Calvo/Vandenbroeck/Pandolfi/Dahdouh-Guebas; Sheldrake 2021; Gagliano 2018; Mancuso/Alessandra 2015; Marder 2013; Narby 2005.
6 Myers 2021.
7 See the conference *Thinking with Plants and Fungi*, Harvard University, Cambridge/Mass., 2025; the exhibitions *The Senses of Plants*, Villa Merkel, Esslingen, 2024; *Rooted Beings*, Wellcome Collection, London, 2022; *Die Intelligenz der Pflanzen*, Frankfurter Kunstverein, 2021–22; *Das Parlament der Pflanzen I und II*, Kunstmuseum Liechtenstein, 2021 and 2022; *Von Pflanzen und Menschen,* Deutsches Hygienemuseum Dresden, 2019.
8 Cf. Aloi 2022.
9 Messmer in the frame of the workshop: *For Plant Intelligence*. Mesh-Festival / HGK Basel FHNW, Oct. 18–19, 2024, as well as Koechlin/Ammann/Messmer/Gelinsky/Haerlin/Kunz/Messmer/Ott/Sitter-Liver/Ziegler/Zschunke 2011. On bacteria, also see Koechlin 2025.
10 Katja Tielbörger as well as Mariateresa Lazzarato and Christine Arncken from the FiBL have made this clear in several conversations. For Paco Calvo, this is also a philosophical issue (Paco Calvo in conversation with Yvonne Volkart, 10/03/2025). For Zoë Schlanger, this question must be socially negotiated (Schlanger 2024, p. 244). Many thanks to Kathrin Meyer for this reference.
11 Yvonne Volkart in conversation with Paco Calvo, 10/03/2025.
12 Ibid.
13 Ibid.
14 Ibid.
15 Martina Peter explores mycorrhizae at the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL) in Birmensdorf. She concedes that the non-detectability of the currently much-vaunted 'social' behavior of trees and fungi does not mean that it does not exist; it has only not been sufficiently researched. Martina Peter in conversation with Yvonne Volkart, 06/03/2025.
16 Trewavas 2003, p. 1.
17 Trewavas reformulates the definition by David Stenhouse, who describes animal intelligence as "adaptively variable behavior during the lifetime of the individual." He replaces "behavior" with "growth" and defines growth as behavior.
18 Tielbörger 2025, pp. 44–45.
19 In a similar way, the anthropologist Luci Attala, from the perspective of New Materialism, interprets vegetal communication via smells. See Attala 2017.
20 Elsewhere, Paco Calvo referred to a car driver who "automatically" or "proactively," as it seems, hits the breaks in the face of an unforeseen danger. See Castelblanco 2024.
21 Marder/Parise 2024.
22 Cf. Volkart 2025a.
23 Cf. ibid.
24 The biophysicist Hans-Günther Döbereiner in an email to Yvonne Volkart, 08/25/2019. This is a definition preferred by many scientists, e.g., Sheldrake 2021.
25 Schneider 2025 also pursues this neo-materialistic approach. See also Volkart 2025b.
26 Döbereiner, in an email to Yvonne Volkart, 08/25/2019, and Sheldrake 2021 conceive the most general definition of intelligence as the solving of problems.
27 Team Plants_Intelligence 2024.
28 Aloi/Volkart 2025.

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CREDITS

FIG. 1–2: © Rasa Smite, Photo: Rasa Smite

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