Beyond Barren Wastelands: The Greening of the Post-apocalypse in Video Games

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Abstract

Video games often depict post-apocalyptic environments characterized by loss and destruction. Some video games, however, challenge this paradigm through representations of lush greenery and thriving gardens that signify environmental recuperation in the wake of world-ending devastation. This essay explores how these virtual worlds engage with ecological recovery and connection by drawing on critical plant studies and scholarship about video games as ecomedia. Specifically, the essay analyzes two video games: Plants vs. Zombies *and* Cloud Gardens. *Despite their different mechanics and aesthetics, both games envision speculative futures where vegetation thrives in the post-Anthropocene.* Plants vs. Zombies *tasks players with amassing an army of formidable foliage to combat hordes of the living dead, while* Cloud Gardens *prompts players to cultivate flora in neglected manufactured landscapes. In each game, plants are cast as vital agents in shaping the environment, encouraging players to critically consider nonhuman ontology and humans' ecological entanglements. These playful plantings also reflect on practices concerning resource scarcity, sustainability, and related environmental issues. In examining these games, the essay demonstrates the potential for video games to promote ecocritical or "green" perspectives through the post-Anthropocene, posthuman, and post-apocalypse.*

The digital dioramas in Noio's *Cloud Gardens* (2021) share aesthetic similarities with many postapocalyptic wastelands appearing in popular media. Drab and desolate landscapes of concrete and alloy are littered with weathered appliances, rusty street signs, and other man-made refuse. The video game, however, offers no narratives about broken people and their struggle to survive, nor any violence or longing linked to a lost humanity. Instead, its virtual vignettes ask players to reclaim the urban decay with lush, creeping greenery by sowing seeds, cultivating vegetation, and harvesting flowers. Through these designs, *Cloud Gardens* envisions a future defined by the resilience of plants, not people. As one Kotaku writer explains,

> *By presenting to you this world that is so unmistakably alive, and so clearly built on the*

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> *aesthetics of social collapse,* Cloud Gardens *rejects the notion that the end of the world as we know it is a loss, or an ending at all. The world it imagines does not hate people, it just is not built around them.* (Price, 2021)

Price's review of *Cloud Gardens* illustrates how the game subverts anthropocentric paradigms in game design and storytelling to imagine nonhuman resilience in a *post*-human world. Both the video game and its review inspire questions about how video games situate humans ecologically through simulations of the post-apocalypse and post-Anthropocene.

To consider these questions, we might first address the Anthropocene in concert with posthumanism. There is some debate about the exact dates and description of the Anthropocene, but this geological epoch is generally defined as one in which humans are having substantial lasting impacts on Earth's geology and ecosystems as evidenced by climate change, biodiversity loss, and more (Edwards, 2015). The Anthropocene, through the Greek prefix *anthropo-* (meaning "human"), highlights both the magnitude of human influence on the planet and the finitude of human existence (Crutzen & Stoermer, 2000). Regarding ecological disasters produced by the Anthropocene, Donna J. Haraway (2016) poignantly summarizes one perspective expressed by scientists, cultural theorists, and political progressives. It is "a position that the game is over, it's too late, there's no sense trying to make anything any better, or at least no sense having any active trust in each other in working and playing for a resurgent world" (p. 3). Haraway's (2016) description captures sentiments of hopelessness and isolation in response to the compounding realities of a global climate crisis, mass extinctions, resource scarcity, etc. This defeatist outlook often fuels postapocalyptic fiction that imagines futures without humans. As literary critic Greg Garrard (2012) suggests, both misanthropic and disanthropic worlds are born of "a cruel, defensive response to the fundamental challenge ecological crisis poses to our sense of reality," (p. 44). Despite this defeatism, which Haraway (2016) calls an "explicit 'game over' attitude" (p. 3), she urges we continue to work *and play* towards finding solutions that acknowledge our deep, earthly entanglements. This call to focus on humans' ecological relationalities defines a particular kind of posthumanism[1] aligned with Carey Wolfe's (2010) work to illustrate the ethical importance of human-ani-

mal relations and Timothy Morton's (2016) endeavor to underscore the interconnectedness of humans and the environment. Collectively, these ideas constitute an effort to trouble the primacy and centrality of humans in Western thought as well as foster ethical considerations for the nonhuman. The tension between the various perspectives outlined here are often the inspirational seeds for dystopian games that envision the end of the Anthropocene and ask us to play anyway.

These timely perspectives are some of the many reasons why the video game market is saturated with apocalyptic and post-apocalyptic worlds.[2] Consider, for example, the longevity and popularity of series such as *Wasteland* (Interplay Productions, 1998), *Fallout* (Interplay Productions, 1997), *Half-Life* (Valve, 1998), *BioShock* (2k, 2007), *Left 4 Dead* (Valve South, 2008), and *The Last of Us* (Naughty Dog, 2013), as well as standalone titles such as *Frostpunk* (11 Bit Studios, 2018), *Death Stranding* (Kojima Productions, 2019), *Stray* (BlueTwelve Studio, 2022), and more. As works of both simulation and speculative fiction, video games broadly have the potential to "contribute to ongoing social critique and more importantly, how to improve things" (Ouellette, 2021, p. 19), and post-apocalyptic games are no exception. Their dystopian worlds are possibility spaces to grapple with the precarity of human existence and enact moments for "emotional rehearsal" (Yeates, 2021, p. 123) with challenges real or imagined. Moreover, post-apocalyptic games typically aim to induce fears associated with moments of unrelenting cruelty, violent destruction, and haunting loneliness by adopting themes and tropes from horror (Wintle, 2023). Also drawing on science fiction, post-apocalyptic video games "make visible anxieties about societal decline, climate change, and ecocatastrophe" (Op de Beke et al., 2024, p. 30), sometimes pointing to opportunities for individual and societal change that might yield resilient and sustainable futures. Thus, post-apocalyptic video games are ripe for considering not only the end of the world but also how we might find ways to stave off particularly devastating futures by thinking or acting differently. Games about plants and planting in the post-apocalypse are not unique in this regard; however, their representations decenter humans from the primary focus of such narratives to engage in posthumanism, rather than human-specific ideas of recovery.

The potential of video games, in any genre, to engage with the (post-)Anthropocene, the posthuman, and related ecological topics has been the subject of much scholarly conversation already.[3] Notably, Hans-Joachim Backe (2014) calls attention to the capacity of mainstream video games to invite environmental conscientiousness, spurred by studies in ecocriticism. Similarly, Alenda Chang and John Parham (2017) illustrate how elements specific to games and gaming can expand concepts of ecologies and environment. Others have drawn attention to how games simulate complex ecosystems (Brown, 2014) and provide spaces for ecological reflection (Smith, 2017) as well as ecocritical play (Bianchi, 2017 & Bianchi, 2019). Adding to this conversation about video games as ecomedia, I examine how video games about gardening in the post-apocalypse consider nonhuman, ecological recuperation in a posthuman world. Inspired by perspectives from critical plant studies, I argue that cultivating virtual vegetation in post-apocalyptic gardens offers opportunities to acknowledge the

nonhuman, challenge anthropocentrism, and reimagine our ecological interconnectedness. In these futures of disaster recuperated by nonhuman life, we can also find ways to reflect on resource scarcity, sustainability, and other environmental concerns.

Plant-Thinking and Gardening Games

To analyze how plants depicted in video games address the various "posts-" of this journal special issue, I draw on perspectives from critical plant studies. Critical plant studies is an interdisciplinary field of scholarship that critically and ethically considers vegetal life from philosophical, aesthetic, and cultural standpoints. Significantly shaped by the works of Haraway (1991, 2008), Wolfe (2010), Morton (2016), and more, the field draws rigorous attention to how we incorporate and represent the nonhuman in a variety of media and practices. With its deep roots in efforts to challenge anthropocentrism and foster ecological thinking then, critical plant studies is a useful frame for studying virtual vegetation and their entanglements with the posthuman, post-Anthropocene, and post-apocalypse.

Specifically, my analyses address a central problem for critical plant studies often reified by video games: "plant-blindness." Plant-blindness, according to botanists James H. Wandersee and Elizabeth E. Schussler (1999), is a condition where humans fail to recognize plants' unique features, environmental presence, or ecological importance. Giovanni Aloi (2019) extends this description further explaining that plant-blindness is "our cultural inability to conceive plants beyond the prefixed cultural schemata. It is that which simultaneously reduces them to resources or aesthetic objects" (p. xx). Plant-blindness is a failure to acknowledge the complexities of vegetal life and is often perpetuated by anthropocentric practices and aesthetic representations that objectify and marginalize plants. There is a long tradition of plant-blindness reducing the vegetal to background, decoration, or the symbolic within art and media (Aloi, 2019)—a tradition to which many video games also contribute. As Alenda Chang (2019) observes in her pioneering study of ecology in video games, "digital plants are for the most part mass-produced clichés that are simultaneously hypervisible and invisible, ubiquitous enough to pass beneath notice, designed to be seen and ignored" (p. 123). She attributes this issue, in part, to digital asset libraries that reproduce "anthropocentric bias" (Chang, 2019, p. 122) advocating for the importance of practices, such as "plant-thinking" (Marder, 2013), that call attention to nonhuman ontology as well as our interspecies and ecological interconnectedness. Thus, challenging plant-blindness, broadly and in video games, requires cultivating plant-thinking and other posthumanist perspectives that ethically acknowledge nonhumans and our entanglements with them.

Used as a lens for game studies, plant-thinking has contributed to critical and ethical evaluations of plant representations in video games. Chang (2019) performs this work in studying the complexities and reductions inherent in the processes of modeling virtual trees, calling for more nuanced analyses of virtual plant assets. She ultimately argues for the importance of exploring design practices that can yield greater ecological accuracy while acknowledg-

ing current production efforts working referentially and materially with plants. Responding to Chang's work, Merlin Seller (2024) incorporates plant-thinking in an analysis of digital grasses in video games including *The Last of Us Part II* (Naughty Dog, 2020) and *Flower* (Thatgamecompany, 2009). Whereas Chang critiques inert and passive plant assets, Seller contends that virtual grasses, particularly in postapocalyptic landscapes, trouble anthropo-centric ideals specifically through their passive and ubiquitous presence. In confronting landscapes of profuse and unresponsive grass, virtual vegetation can problematize ideals concerning agency and interactivity as well as foreground and background. Beyond the trees and grasses studied by Chang and Seller, there remains a rich body of virtual vegetation warranting examination. Branching from Chang and Seller's applications of plant-thinking in game studies, I attend to post-apocalyptic gardens in video games, analyzing how these speculative spaces encourage plant-thinking by means that do not always rely on referential or material fidelity as well as passivity.

Gardens, real or virtual, are especially fertile sites for cultivating plant-thinking.[4] Cultur-ally, real-world gardens are spaces in which humans repair environmental damage, create aesthetic effects, and exert biopower (Aloi, 2019; Jacobs, 2019; Marris, 2013). Aloi (2019) notes, "the garden represents the artificially preserved oasis amidst the challenges of cli-mate change. And in so doing, it metaphorically inscribes the desire to control the planet in an efficient, self-substantiated way" (p. 105). This desire to control manifests in humans' application of knowledge and technologies towards maintaining thriving vegetal life. In actual gardens, these applications of human biopower draw acute attention to plants because human efforts are often undermined by interplant competition for resources, differences in individual plants' biological needs, and other environmental factors affecting plants, e.g., weather, water and soil quality, and parasites (Jacobs, 2019). Though virtual gardens may not be as visually or procedurally complex as actual gardens, video games like *Viridi* (Ice Water Games, 2015), *Prune* (Polyculture, 2015), and *Pocket Plants* (Shikudo, 2016) simulate practices of vegetal control, such as planting, watering, fertilizing, pruning, and harvesting, while compelling players to acknowledge plants through their obvious "phytocentric" (Mard-er, 2014) designs. Gardens, as contentious sites of environmental control, have also served as useful metaphors for thinking about games. In her manifesto on environmental game design, Chang (2020) adopts Emma Marris's (2013) "rambunctious garden"—a concept used for envisioning nature in a post-wild world—to rethink games as rambunctious exterior worlds with profound environmental meaning.

Even in ruined virtual worlds do gardens offer substantial commentary on our ecological entanglements. Practices of playful planting in these virtual spaces can challenge anthropo-centrism by critically acknowledging the nonhuman as well as reimagining our ecological relationships. Additionally, the design and directives in post-apocalyptic gardens are exer-cises in using limited resources efficiently in harsh environments—mechanics that offer valuable insights into resource management and sustainable practices. How players interact with dystopic digital gardens through tending, harvesting, or destroying them, can also com-

plicate understandings of human environmental agency and responsibility. In the following section, I analyze the post-apocalyptic gardens in *Plants vs. Zombies* (PopCap Games, 2019) and *Cloud Gardens* to demonstrate how these themes emerge through design and gameplay.

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Playful Plantings

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Both *Plants vs. Zombies* and *Cloud Gardens* uniquely ask players to garden at the end of the world. Though these video games share a somewhat similar underlying premise, these games offer distinct imaginings of a post-Anthropocene inherited by plants. *Plants vs. Zombies*[5], a fast-paced, cartoon-style tower defense game, tasks players with amassing an army of formidable foliage to combat invading hordes of the living dead. In the game's arcade-like Adventure mode[6], players assume the role of a human homeowner who must rely on weaponized vegetation to protect themselves and their property from multiple undead incursions. In contrast, *Cloud Gardens*, a puzzle and sandbox simulation game, encourages players to grow vegetation by placing human debris in neglected manufactured landscapes. Lo-fi virtual roadways, junkyards, and parking lots become fertile grounds to grow plants of various shapes and sizes in this developer-described "chill game" (*Cloud Gardens*, n.d.). Through their apparent differences in genre, aesthetics, and mechanics, these video games, when taken together, capture a broad range of possibilities for how games might support plant-thinking and other ecocritical perspectives. Moreover, the role of the human player as an agent for cultivating and destroying plants in these games presents opportunities to reflect on environmental agency and responsibility in the Anthropocene.

Against the Perceived Homogeneity and Passivity of Plants

Through vegetal representations that are complex, dynamic, and central to gameplay, *Plants vs. Zombies* and *Cloud Gardens* eschew anthropocentrism and plant-blindness. Set in the post-Anthropocene, both games focus acutely and explicitly on plants, highlighting their active presence in the virtual environment rather than reducing them to inert foreground and background objects. This feature challenges plant-blindness, which often renders plants marginal because of their fixity and immobility in environments. Often, plants are misconstrued as passive, homogenous objects because humans tend to privilege ambulation and movement, which ultimately diminishes plants' significance (Aloi, 2019; Casey & Marder, 2023). In each game though, the design of plants acknowledges qualities of vegetal difference, fixity, immobility, and ecological importance while also subverting notions of plants' perceived indistinguishability and passivity. By examining how game designs develop active and dynamic (albeit, at times, inaccurate) vegetal representations, we can observe how *Plants vs. Zombies* and *Cloud Gardens* persuasively situate plants as collaborators and successors to humans.

Plants vs. Zombies at once acknowledges plants' fixity through environmental design, while challenging plants' perceived indistinguishability and passivity through its rambunctious

characters. Each level of the game occurs on a five-by-nine grided lawn with the player's home located on the left side of the screen and invading zombies approaching from the right. If a zombie reaches the player's home in any of the five rows of the grid, the player loses the game. Plants can be purchased and placed in grid spaces to inhibit zombies, but they cannot be moved once planted, only destroyed with a shovel. Still, this does not mean plants operate as inert and homogeneous bystanders in the post-apocalyptic conflict. The over fifty different plants in the game are comprised of a diverse cast of cartoonish shrubs, fruits, vegetables, and a few fungi that cheekily reference the diverse features and functions of actual flora, albeit through anthropomorphic aesthetics (e.g., emotionally expressive cartoon faces) and anthropocentric systems of classification (e.g., the game's "almanac" describes how each plant might serve "you," the human player, in zombie combat). These qualities of the plant representations at once acknowledge their diversity but foreclose possibilities for considering this diversity outside of human-centered frameworks.

Though they remain fixed in the garden, the virtual plants subvert notions about vegetal passivity by actively attacking or defending against invading zombies. These confrontations are accompanied by dynamic animations and obtrusive sound effects unique to each type of plant. For example, a Peashooter loudly spits projectile peas at enemies, while Chompers (Venus flytrap-like carnivorous plants) devour the nearest invader whole, making loud gnawing noises as they chew. Other plants' designs acknowledge the adaptive qualities of plants through the game's upgrade system, which can turn Lily Pads into Cattails, Melon-pults into Winter Melons, etc., changing their aesthetics and improving their functions on the battlefield. Some plants, such as Wall-Nuts and Umbrella Leafs, illustrate beneficial interspecies interactions as these plants can shield other vegetation from zombie attacks—a strategy serving multiple types of flora as well as the human player. These striking representations of vegetal diversity and activity strongly emphasize for players the importance of an awareness of plants' environmental presence, unique features, and ecological functions to succeed in the game. In this way, *Plants vs. Zombies* simulates plant-thinking that acknowledges our unique relations with and reliance on vegetation.

Cloud Gardens also challenges assumptions about plants' homogeneity and passivity through its designs. Unlike *Plants vs. Zombies, Cloud Gardens* addresses vegetal diversity though lo-fi game assets designed to resemble actual plants. Plants in the game are cataloged visually through cards featuring plant names, such as wisteria, opuntia, and monstera, without textual descriptions. These minimal verbal explanations avoid explicitly categorizing flora based on their perceived functions, resisting anthropocentric systems of knowledge that exert human mastery over plants by reducing them to specific uses. Players, then, must carefully observe the plants in their environments to distinguish one from another as well as the manners in which they might grow to overtake elements of the wastelands.[7] These practices of looking carefully at vegetation during play challenge plant-blindness in their attentiveness to the nonhuman and may extend to other contexts beyond video games.

Regarding plants' perceived passivity, vegetation in *Cloud Gardens* rarely remains immobile. As players place limited quantities of manufactured debris, such as toys, chairs, cars, and even shipping containers, in the virtual environment, plants begin to crawl, creep, stretch, and sprawl, covering the once apparent remnants of human civilization. In the digital dioramas, plant cover is measured in percentages by an indicator, and once a stage meets a designated threshold before running out of debris, players can move to the next stage to discover new seeds and plant some more. These playful planting mechanics in campaign mode[8] uniquely reorient the function of what once were human artifacts around vegetation. Price (2021) captures this moment by explaining,

> *This is what* Cloud Gardens *delights in. Removing the human referent from human objects. A beer bottle is not a beer bottle in* Cloud Gardens*, it is a round thing that makes plants grow. The impossible road signs aren't supposed to communicate anything to us, they're just there to construct an environment for plants to inhabit. The plants become the new referential object for* Cloud Gardens*' world. (Price, 2021)*

In essence, *Cloud Gardens* uniquely reorients the function of what once were human artifacts around plants. The video game offers players objects on which they may be tempted to inscribe meaning and stories, only to discover that, in this virtual post-Anthropocene, human meaning has little importance or power. Rather, the legacy and value of human objects are determined by their usefulness to nonhumans whose ways of actively moving and being in the world are drastically different from our own. Still, players continue through the game ceding and seeding meaning. This subversion of anthropocentrism and acknowledgement of nonhuman ontology in *Cloud Gardens* posits one version of what it might mean to engage in posthuman play.[9]

Environmental Niches, Resource Management, and Sustainable Practices

The post-apocalyptic worlds of *Plants vs. Zombies* and *Cloud Gardens* are also characterized by environmental conditions that emphasize the importance of managing limited resources efficiently, encouraging players to consider and practice sustainability. The various stages of both games restrict players' access to space for planting as well as resources that can contribute to successfully growing vegetation. In *Plants vs. Zombies*, time is also used as an additional limiting resource that constrains players' ability to cultivate teeming and effective gardens, while *Cloud Gardens* avoids time restrictions by design. Players of either game, then, must strategize how best to use their limited resources to sustain their gardens, and this often requires making practical choices based on the specific tactical and environmental niches, or roles, diverse flora fill. These resource management mechanics call attention to humans as ecological agents responsible for making sustainable choices both in and beyond virtual worlds.

To offer an example of these processes in practice, consider a typical stage in *Plants vs. Zom-*

bies, and the types of resource negotiations required to succeed. During a zombie invasion, players must collect "sun," a limited resource appearing in small quantities over timed intervals used to purchase plants. Plants are also a limited resource in that players are restricted in the number of seed types they can select for each stage of the game. Plants also cannot be refunded for "sun" and can be destroyed. Because plants have distinct functions, such as sun production, shooting, exploding, blocking, etc., they should be strategically purchased and placed in the garden to combat specific zombie abilities (increased health, jumping, swimming, etc.) and certain environmental conditions (fog, night, water, etc.). For example, defensively weaker plants shooting long-ranged projectiles should be placed nearer to the left side of the screen, away from immediate contact with zombies, whereas plants capable of shielding against zombies' physical attacks are more effective if placed nearer to the right of the screen and in front of weaker plants. Space, as a resource, is also limited in the grid design, and in later levels, is restricted further by gravestones that occupy squares and produce additional zombies. To succeed in the game then, players must select the appropriate plants that can respond to tactical and environmental conditions in each stage while maximizing the use of "sun," time, and space to thwart the sporadic waves of zombie invaders. Ultimately, *Plants vs. Zombies* is an exercise in finding solutions that rely on understanding the problem of resource scarcity and acknowledging the value of plants' specific niches and sustainable practices.

Cloud Gardens similarly tasks players with managing limited resources to cultivate plants. Human debris in each stage of the game is in short supply and must be placed within range (indicated by a circular reticule) of as many plants as possible to maximize growth and flowering. Haphazardly placing objects too close to plants, however, risks catastrophic results. Should an item crash into established vegetation, plants may be destroyed, inhibiting players from completing the stage. Players can collect flowers to make additional plant seeds available, continuing the mechanical loop of planting and growing vegetation. Space in the digital dioramas is a limited resource as well, so players must consider the many ways different plants grow in the game and how to group them proximally for best results. For example, wisteria can expand vertically over poles, pillars, and columns, while opuntia seeds require horizontal surfaces to be planted. Using combinations of plants can often cover more surfaces than a single type of vegetation alone. Grouping plants optimally and proximally is a sustainable practice for progressing through the various stages of the game, but the effects may not always be aesthetically pleasing. Some players might approach the stages of the game with the intention of producing specific aesthetic effects, but these strategies can vary in their effectiveness as well as reinscribe anthropocentric ideals that the campaign's mechanics seem to repudiate. Such aesthetic gameplay practices are risky and best conducted in the game's Creative mode, which lacks resource restrictions. Thus, *Cloud Gardens* also simulates resource scarcity encouraging environmentally aware and sustainable practices that sometimes are at odds with less optimal, human-centered choices.

Alternative Modes of Being

In both *Plants vs. Zombies* and *Cloud Gardens*, the virtual plants share their post-apocalyptic worlds with other nonhuman agents that encourage additional considerations for ecological relationalities. These representations of alternative modes of being in the world draw attention to nonhuman, non-vegetal ontologies. They also further illustrate the need to orient humans in broader ecological contexts to support finding ways of navigating the Anthropocene.

If plants in *Plants vs. Zombies* signify beneficial environmental intervention and entanglement, the game's zombies configure the negative alternative: ecological estrangement. The zombies, despite their cartoonish aesthetics, function like the slow-moving hordes of the undead appearing in other games and media by representing liminal states that blur the lines between life and death, individual and swarm, self and soullessness, etc. (May, 2021, p. 37). Uniquely though, the zombie designs in the game critique ideas about what separates human from nonhuman life on the planet: technology and culture. The game's zombies do not always shamble about aimlessly—they play football, read the news, and disco dance. They also utilize tools—climbing ladders, launching catapults, and driving Zambonis. These quirky zombie activities satirize human behaviors and the notion that humans are solely defined by technology and culture. The game underscores how biological factors shared with other lifeforms (i.e., living and dying) are vital qualities of humanity. By coupling technology and culture with an antagonism towards the living, specifically humans and plants, the zombies depict a grim legacy for those humans removed from life on the planet. Technology and culture devoid of ecological connection is undeath, both materially through the zombie body and metaphorically in a lifeless post-apocalypse existence. Thus, *Plants vs. Zombies* starkly charts two potential paths out of the Anthropocene. Either we face the consequence of ecological detachment, zombification, or thrive through successful ecological co-existence, symbolized by the player-character's alliance with plants.

In *Cloud Gardens*, black birds are the only other inhabitants of the post-Anthropocene, and their presence in the game helps trouble tendencies towards anthropocentric and phytocentric play. The digital birds fly in and around the dioramas of the game, sometimes landing on the virtual landscapes players manipulate. Players cannot control these nonhuman characters, a design quality denying illusions of human mastery over the nonhuman found in many other video games where one plays as an animal (Caracciolo, 2021). Even so, players can briefly interact with the birds by clicking on them with the cursor in the PC version of the game. Clicking on the birds causes them to squawk and fly away, resuming their patterns of flight around the virtual stage only to return later and land again. Their animated interest in the plants and coded indifference to the human player is a stark contrast from the many diverse ways of engaging with the game's virtual vegetation (i.e., seeding, growing, harvesting). These limited interactions with the birds, especially when compared to plants, highlight for players an alternative mode of being in the world—one that renders the human (and not the nonhuman) as largely ineffectual and marginal. The mostly unresponsive black birds remind players that humans and plants are not the only agents inhabiting ecosystems and that the natural world can persist and flourish despite humans' intervention or absence.

Finding More Fertile Ground

Post-apocalyptic video games about plants, then, offer opportunities to consider the non- and posthuman. Using critical plant studies as a lens to analyze video games reveals how these works might support play that challenges anthropocentrism and acknowledges ecological relationalities. By interacting with virtual vegetation in these dystopian landscapes—tending, harvesting, or even destroying it—players also confront ideas about human environmental agency and responsibility. Additionally, players' experiences within these virtual gardens can become exercises in managing resources efficiently, demanding strategic planning and thoughtful uses of limited supplies. As players navigate these harsh environments, they gain valuable insights into sustainable practices that can resonate with the real-world challenges we face in the Anthropocene.

Despite the potential for plants in post-apocalyptic video games to help us engage with posthumanism and the Anthropocene, they are by no means perfect or accurate systems for simulating our current conditions or prospective futures. Notably, the human player remains unavoidably central to these video games, often implicated as the "you" in the writings of *Plants vs. Zombies* or as the garden-gloved mouse cursor in *Cloud Gardens*—both have significant power to manipulate and destroy many elements of their virtual worlds. Moreover, these video games overlook possibilities for representing more complicated interplant relations that can further develop posthuman and ecological perspectives. For example, the vegetal life of *Plants vs. Zombies* does not reflect interplant conflict that might result in friendly fire nor do these characters encroach on one another's squares in the grid. Similarly, in *Cloud Gardens*, the plants do not perish when they compete for space. Denying inter-vegetal conflict reduces plant interactions and overlooks moments for vegetal resistance against human efforts to create and shape the world. How, then, might we improve the ways plants are incorporated into video games to develop more critical and ethical approaches?

There are some options. One radical tactic might be to eliminate the human player entirely, designing games for plants—an idea explored by Ruzanka (2023) bearing similarities to animal–computer interaction (ACI) research on designing technologies for nonhuman users. Beyond this idea and the existing calls for referentially, materially, and culturally informed plant designs (Chang, 2019; Seller, 2024), we might place greater emphasis on cultivating plant-thinking for players through the communication networks supporting their gaming. For example, creating spaces that make explicit connections between both virtual and actual plants. The official *Cloud Gardens* public Discord server takes steps towards this effort by including amongst its various game-related chats a channel titled "real-world-plants" where members share information and photographs about plants they encounter and interact with outdoors and in their own homes. Here, players can engage with one another's experiences with actual plants alongside conversations about the design of virtual ones for the game. These communicative practices encourage critical and ethical considerations for our coexistence with plants and the ways video games mediate this relationship.

For now, playing with virtual vegetation offers fresh perspective on how video games are using post-apocalyptic tropes. Digital gardens in the ruins of post-apocalyptic worlds are spaces to decenter humans and reorient our place within a broader ecology. They are also fertile ground for reimagining current environmental efforts in the Anthropocene, finding ways to engage in, as Haraway would say, "playing for a resurgent world" (Haraway, 2016, p. 3). In greening the post-apocalypse, video games encourage us to consider new perspectives and practices, reminding us that "the game" of finding actionable solutions is far from over.

Endnotes

1   Haraway has publicly distanced herself from the term "posthuman," expressing concerns about its misappropriation. Regarding her own work, she expounds, "I've stopped using [posthuman]. I did use it for a while, including in the 'Manifesto'. I think it's a bit impossible not to use it sometimes, but I'm trying not to use it…I think of the 'Cyborg Manifesto' and *Companion Species Manifesto* (2003) as bookends around an interrogation of relationalities where species are in question and where posthuman is misleading" (Gane, 2006, p. 140).

2   In his study of virtual post-apocalyptic ruins, Robert Yeates (2021) observes, "The sheer number of games developed with postapocalyptic settings and featuring urban spaces in various stages of ruin is astonishing" (p. 118).

3   For an excellent account of the conversation thus far and what might follow, see *Ecogames: Playful Perspectives on the Climate Crisis* (2024) edited by Laura Op de Beke, Joost Raessens, Stefan Werning, and Gerald Farca.

4   As are farms. Chang (2012) addresses virtual farms in her scholarship on agriculture-management games.

5   *Plants vs. Zombies* was initially released by PopCap Games for Windows and Mac OS X but has since been purchased by Electronic Arts (EA) and ported to consoles and mobile devices. Under EA, *Plants vs. Zombies* has become a multimedia franchise including an array of sequels, spin-offs, and a comic book series.

6   Completing Adventure mode in *Plants vs. Zombies* (2009) unlocks three additional gameplay modes: Mini-Games, Puzzle, and Survival. These modes present players with unique challenge levels that add variation to the narrative, rules, and mechanics encountered during Adventure mode.

7   Alternatively, curious players may feel compelled to search out information about these plants from resources external to the game—another means to subvert plant-blind-

ness.

8   *Cloud Gardens* features both a campaign mode and creative mode. While the campaign progresses through various numbered and branching stages, creative mode is a sandbox simulation where players can craft their gardens unconstrained by campaign objectives and mechanics. Creative mode also gives players access to all flora and objects unlocked during the campaign as well as aesthetic controls for adjusting the lighting, fog density, and time of day.

9   For an extended exploration of posthuman gaming, see Poppy Wilde's (2024) *Posthuman Gaming: Avatars, Gamers, and Entangled Subjectivities*.

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