



Blackwater
Mine



Whitebark Pine 2025 Annual Report

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1.0 Purpose

Whitebark pine (*Pinus albicaulis*) is an endangered conifer species native to the mountainous regions of western Canada and plays a critical ecological role in high-elevation ecosystems. The species is listed as Endangered on Schedule 1 of the federal Species at Risk Act (SARA), primarily due to four key threats: (1) white pine blister rust, caused by the non-native fungal pathogen *Cronartium ribicola*; (2) mountain pine beetle (*Dendroctonus ponderosae*); (3) altered fire regimes; and (4) global climate change (Environment and Climate Change Canada [ECCC], 2017). In the federal recovery strategy, mining and other direct human impacts are not listed as primary causes of decline, though their impacts may be acute and have impacts on local populations (ECCC 2017).

Declines in whitebark pine populations have far-reaching ecological implications as it plays a role as a keystone species in high elevation ecosystems. As a keystone species, whitebark pine contributes to soil stabilization, moderates snowpack dynamics (Farnes, 1990), facilitates the formation of tree islands, and provides an essential high-calorie food source for numerous wildlife species. These include grizzly bears (*Ursus arctos*), red squirrels (*Tamiasciurus hudsonicus*), and notably Clark's nutcracker (*Nucifraga columbiana*), which serves as the primary seed disperser for the species (Tomback & Kendall, 2001).

BW Gold's Blackwater Mine development occurs within whitebark pine habitat and contains a component of whitebark pine trees on-site. Due to the occurrence of whitebark pine, to develop the project, the proponent was required to adhere to a series of conditions set out in a project related Decision Statement. The Decision Statement issued under the Canadian Environmental Assessment Act (CEAA) provides a series of conditions to be implemented to mitigate impacts to whitebark pine during project development. These conditions (and their respective sections or details on exclusions in this report) are provided in Table 1.

Table 1. Summary of Conditions and Commitments addressed by whitebark pine work in 2025.

Document		2025 Respective Section Details or Reasons for Exclusion
<i>Federal Decision Statement Condition</i>		
8.19 The Proponent shall conduct progressive reclamation of areas disturbed by the Designated Project. In doing so the Proponent shall identify, in consultation with Indigenous groups, Environment and Climate Change Canada and other relevant authorities, plant species native to the Designated Project area to use for revegetation as part of progressive reclamation, including whitebark pine (<i>Pinus albicaulis</i>) and other conifers suitable to create habitat for southern mountain caribou (<i>Rangifer tarandus caribou</i>) and other species of interest to Indigenous groups.		Section 2.0, 3.0, and 4.0 - Areas for progressive reclamation were identified by surveying and confirming sites and follow up planting. This included initiating reclamation by planting at the Freshwater Reservoir, Lake 15-16, and an upper Mt. Davidson exploration road.
8.20 The Proponent shall develop, prior to construction and in consultation with Indigenous groups, Environment and Climate Change Canada and other relevant authorities, a whitebark pine management plan to mitigate effects from the Designated Project on whitebark pine (<i>Pinus albicaulis</i>) and its critical habitat.	1) establish criteria to be used to evaluate the health of whitebark pine trees and for the selection of whitebark pine (<i>Pinus albicaulis</i>) to be transplanted;	BW Gold Whitebark Pine Field Update – 2022 - Seedlings for potential transplant and previously transplanted seedlings were surveyed. Guidelines for transplant selection were developed.
	2) collect and preserve whitebark pine (<i>Pinus</i>	Section 2.0, 3.0, and 4.0

The Proponent shall implement the plan during all phases of the Designated Project consistent with any applicable recovery strategy related to whitebark pine (<i>Pinus albicaulis</i>). As part of the whitebark pine management plan, the Proponent shall:	albicaulis) rust-resistant seeds within the Designated Project area prior to vegetation clearing and use them for progressive reclamation pursuant to condition 8.19;	- Seeds were collected from healthy trees on site in 2022. A subset of these seeds were submitted for rust screening and a field trial to potentially identify resistant stock was established at the Freshwater Reservoir. Seed from healthy trees (putative resistant) were used to produce all seedlings.
	3) identify the locations to plant whitebark pine (<i>Pinus albicaulis</i>) in undisturbed areas within the Designated Project area prior to construction;	Section 2.0, 3.0 and 4.0 - Areas planted along Lake 15-16 and the upper Mount Davidson road were generally undisturbed from mine development. These areas were planted in 2025 and additional planting opportunities at these sites are present. Additional sites were identified in the BW Gold Whitebark Pine 2023 Annual Report.
	4) implement measures to support whitebark pine (<i>Pinus albicaulis</i>) growth and use by Clark's nutcracker (<i>Nucifraga columbiana</i>);	Section 2.0, 3.0 and 4.0 - The measure implemented in this report is the planting of seedlings. In the Whitebark Pine Management Plan, seedling planting and climate change trials, as initiated in 2025, contribute to addressing this condition.
	5) develop and implement a follow-up program in consultation with Indigenous groups to determine the effectiveness of the mitigation measures included in the whitebark pine management plan. The Proponent shall apply conditions 2.9 and 2.10 when implementing the follow-up program.	Whitebark Pine Management Plan Section 2.2 - The WPMP has been developed in consultation with Aboriginal Groups. The draft plan was provided to Aboriginal Groups for review and comment and revised to address the comments.
The follow-up program shall include:	8.20.5.1 visual monitoring of populations of whitebark pine (<i>Pinus albicaulis</i>), including their health, within reclaimed areas at a minimum every five years;	BW Gold Whitebark Pine Field Update – 2022 - Health of mature whitebark pine, planting trials on mineral exploration roads and drill pads, parent tree trials, and translocation survival

		were all monitored in 2022.
	8.20.5.2 monitoring of use of the reclaimed areas by Clark's nutcracker (<i>Nucifraga columbiana</i>) for the purpose of whitebark pine regeneration. Should the results of monitoring demonstrate that use of the reclaimed areas by Clark's nutcracker (<i>Nucifraga columbiana</i>) is not adequate, the Proponent shall implement additional mitigation measures.	N/A - Progressive reclamation was only initiated in 2025; future plans include the use of visual cues being placed on reclamation features.
Reclamation Closure Plan		
Vegetation and Cover Trials	Freshwater Reservoir - Whitebark pine will be included in the trial to assess the potential survival and establishment of whitebark pine in the SBSmc3.	Seedlings were planted in the FWR area that was prepared in 2025. Seedlings were planted in a series of transects to monitor seedling survival.
Revegetation	Uncertainty 10 - Appropriate native species revegetation prescriptions that will be successful in primary successional conditions and support end land use objectives	Seedlings were planted in a series of conditions including post-disturbance primary succession scenarios including post-fire and post industrial disturbance.
Revegetation	Uncertainty 14 - Ability to re-establish whitebark pine	A subset of seedlings were planted in monitoring transects; the success of these seedlings will support the understanding of the ability to establish whitebark pine.
Land Capability/Habitats	Uncertainty 19 - Ability to reclaim ecosystems to achieve the end land use and capability objectives	A range of end land use objectives were identified, these initial plantings were across a range of ecosystem types and initiate survival studies.
Land Capability/Habitats	Uncertainty 21 - Ability to create drier, low-density forests that support lichen and whitebark pine (for caribou and Clark's nutcracker	Seedlings were planted on a range of sites including dry-warm aspect sites that are good representations of the dry forests described in the RRP.

In response to the conditions of the Decision Statement, BW Gold developed a Whitebark Pine Management Plan (BW Gold Ltd, 2022a) and included Whitebark Pine in the Reclamation and Closure Plan for the Blackwater Project (BW Gold Ltd, 2022b). This report summarizes work conducted in 2025 to partially address the commitments of the aforementioned plans.

2.0 Workplan

To initiate addressing the conditions above and implement a constructive workplan, the following field program was developed for 2025:

- 1) Collect cones as confirmed from 2024 surveys of cone production on-site (DS 8.20.2)
- 2) Confirm planting sites (DS 8.19 and 8.20.3)
- 3) Plant seedling at selected sites including reclamation research sites and field trials (DS 8.19, 8.20.2, 8.20.3, and 8.20.4)

3.0 Implementation

Cone Collections

Cone collections address Decision Statement Condition 8.20.2.

In 2024 mature reproductive trees were surveyed for cone development and a developing crop was confirmed for 2025. In late July/early August 2025 a crew mobilized to site to initiate cone caging on-site.

Just prior to cone collection initiation, a wildfire was discovered on the back of Mount Davidson. BW Gold Safety and Environmental staff accessed the cone collection area to review the risk of collecting cones with the threat of the advancing wildfire. It was decided that it was unsafe to collect cones; thus, this work phase was abandoned for the 2025 field season.

Confirming Planting Sites

Confirming and identifying planting sites addresses Decision Statement Conditions 8.19 and 8.20.3.

Planting sites were identified by environmental staff including the Freshwater Reservoir (FWR), upland areas around Lake 15-16, and a legacy road to upper Mount Davidson.

The Freshwater Reservoir site was identified in the Reclamation and Closure Plan (BW Gold Ltd, 2022b) as a site to test the survival and establishment of whitebark pine in glaciofluvial material and in the lower elevation SBSmc3.

The FWR site was inspected during the summer field visit, it was under construction at the time. Soils were surveyed to confirm they were suitable for whitebark pine establishment; soils were generally mixed through site preparation activities but samples of loam, silt-loam, and pockets of clay/organics were noted. This novel arrangement was likely due to upland areas and near creek areas being combined. Whitebark pine typically occurs in coarse soils though it can also occur on the edges of bogs and swamps characterized by high organic content; thus, the variable soils at the FWR fit the broad amplitude of whitebark pine. The observed soils were further distributed around the site to prepare it for fall planting.

The Lake 15-16 mitigation area was surveyed for planting by walking disturbed areas and surveying soil depth and site factors such as potential heat load and drought potential. The Lake 15-16 site was disturbed through the construction of a linking channel between the two lakes and by recent wildfire which burned across the connecting channel. The site was characterized by post-fire low density regenerating lodgepole pine with very little vegetation cover. The site was generally a hot-warm southeast aspect with deep coarse soils. A high amount of burned tree debris remained on site to provide planting microsites by shading planted seedlings.

The legacy road to upper Mount Davidson was not surveyed during the summer field visit due to the nearby wildfire.

Seedling Planting

Seedling planting address Decision Statement conditions 8.19, 8.20.2, 8.20.3, and 8.20.4.

Seedlings were planted at three locations in late September 2025 including the FWR, Lake 15-16 and the legacy road up Mount Davidson. A total of 4,867 seedlings were planted over a total of 3.2 ha (Table 2, Appendix A). Monitoring and rust trials were embedded in within planting.

Table 2. Summary of seedling planting totals, locations, and area at BW Gold in 2025.

Site	Seedling Count	Area (ha)
Freshwater Reservoir (FWR)	2297	2.0
Rust Trials at FWR	1370	0.2
Lake 15 16	600	0.4
Legacy Davidson Road	600	0.6
Total	4,867	3.2

Planting at FWR was designed to address the RRP commitments of cover trials, blister rust field trials, and climate change trials. Planting at the FWR site was completed both extensively as progressive reclamation planting and in a series of monitoring transects.

At FWR, a series of seedling were planted in monitoring transects, including 60 seedlings in representative transects across the site and 1370 seedlings in rust trials. The trial layouts were as follows:

- **Cover Trials** – Two 30 m transects were established in representative substrates at the FWR site; one transect was in glaciofluvial soils and another was in fine textured soils. A total of 30 seedlings were planted at 1 m intervals along each transect.
- **Rust Trials** – A total of three rust trial transects were established with a total of 1370 seedlings planted (Figure 2; Appendix B). The initial target was to plant ten seedlings from 49 parents in each transect; however, nursery failures resulted in some parents not being represented or only partial representation. In each transect the parents were planted in a block of 10; with the layout randomized for each transect. The field location of each parent tree used to produced seedlings is known and mapped; thus, depending on survival results, each tree can be re-visited and additional seed collected.
- **Climate Change Trials** – The FWS site was located in the SBSmc3 Biogeoclimatic Subzone which may become more common on the site under climate change and replace existing higher elevation ecosystems. Survival of seedlings in the cover and rust screening trials will be used as an initial climate change trial as they may provide insights into lower elevation survival and if individual parent trees are better genetically suited to survival in this environment (in addition to rust resistance).

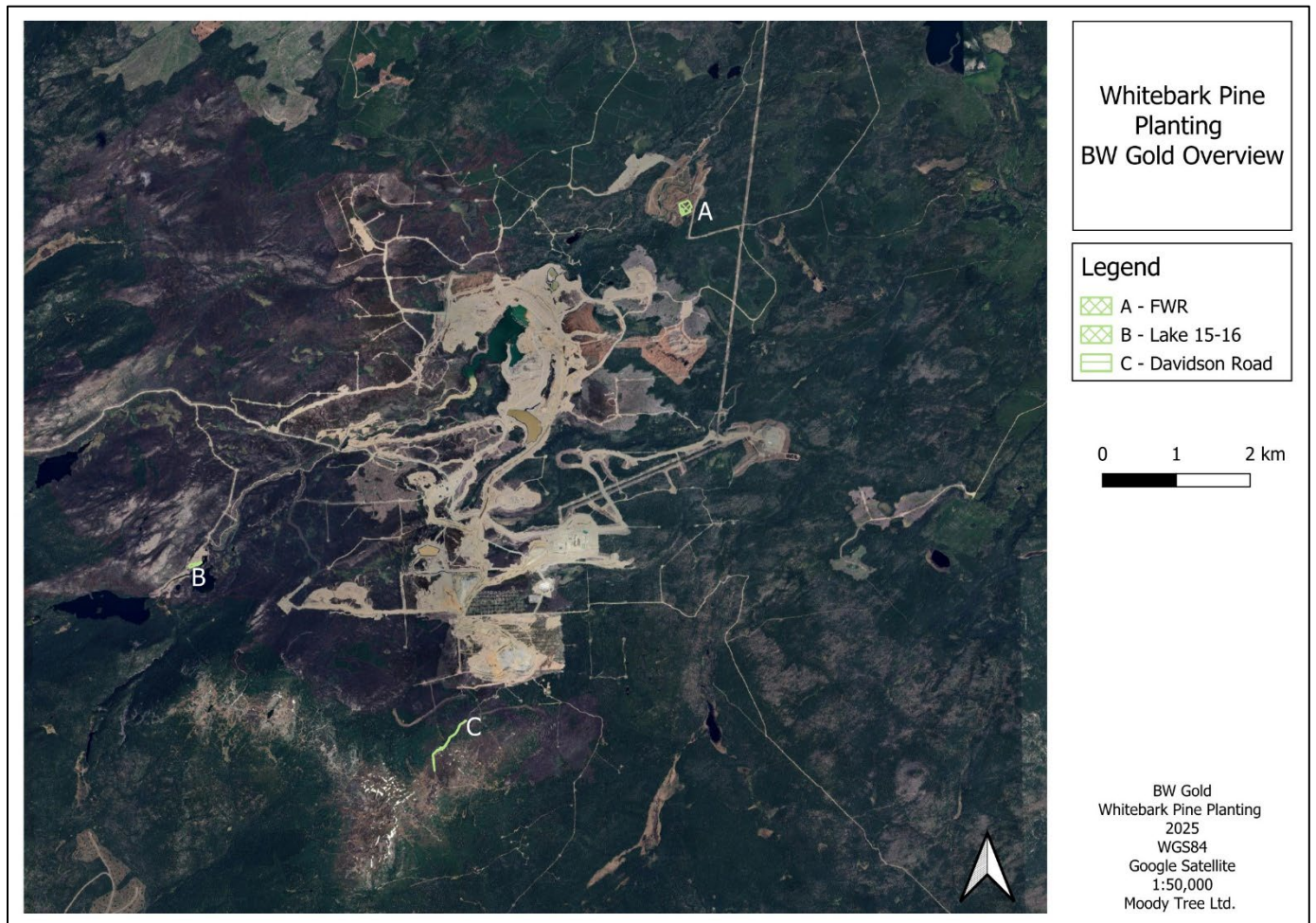


Figure 1. Locations of whitebark pine planting in 2025 at Mount Davidson.



Figure 2. Field trials planting; note seedlings planted between stakes, each stake represents a new parent tree.



Figure 3. Seedlings planted along transect line.

A total of 600 seedlings were planted at Lake 15-16 on warmer aspects than either of the other planting sites. A single 30 m monitoring transect was established here to aid in documenting seedling survival. The planting site was directly adjacent to a disturbance footprint caused by lake channel mitigations and the site was disturbed by wildfire; however, it appeared as though direct mechanical damage to the planting site was limited. Although this site did not fit the disturbance levels to qualify as progressive reclamation, the steep warm aspect coupled with coarse soils, resulted in a site with adequate stressors (heat, insolation, drought) to test the durability of whitebark pine seedlings on high stress sites.



Figure 4. Planting site along Lake 15-16, note buried debris, high coarse fragments, and steep slope.

A total of 600 seedlings were planted along the Upper Mount Davidson Road (Table 1, Appendix A). These seedlings were originally going to be planted as a means to restore the road bed; unfortunately the road bed was too compacted to plant and all seedlings were planted within road cuts along the road edge. The planting was done in a generally ad-hoc manner as planting opportunities were somewhat limited, this planting method did not lend itself to monitoring transects thus follow up monitoring will rely on monitoring of individual seedlings along the roadway.

4.0 Recommendations

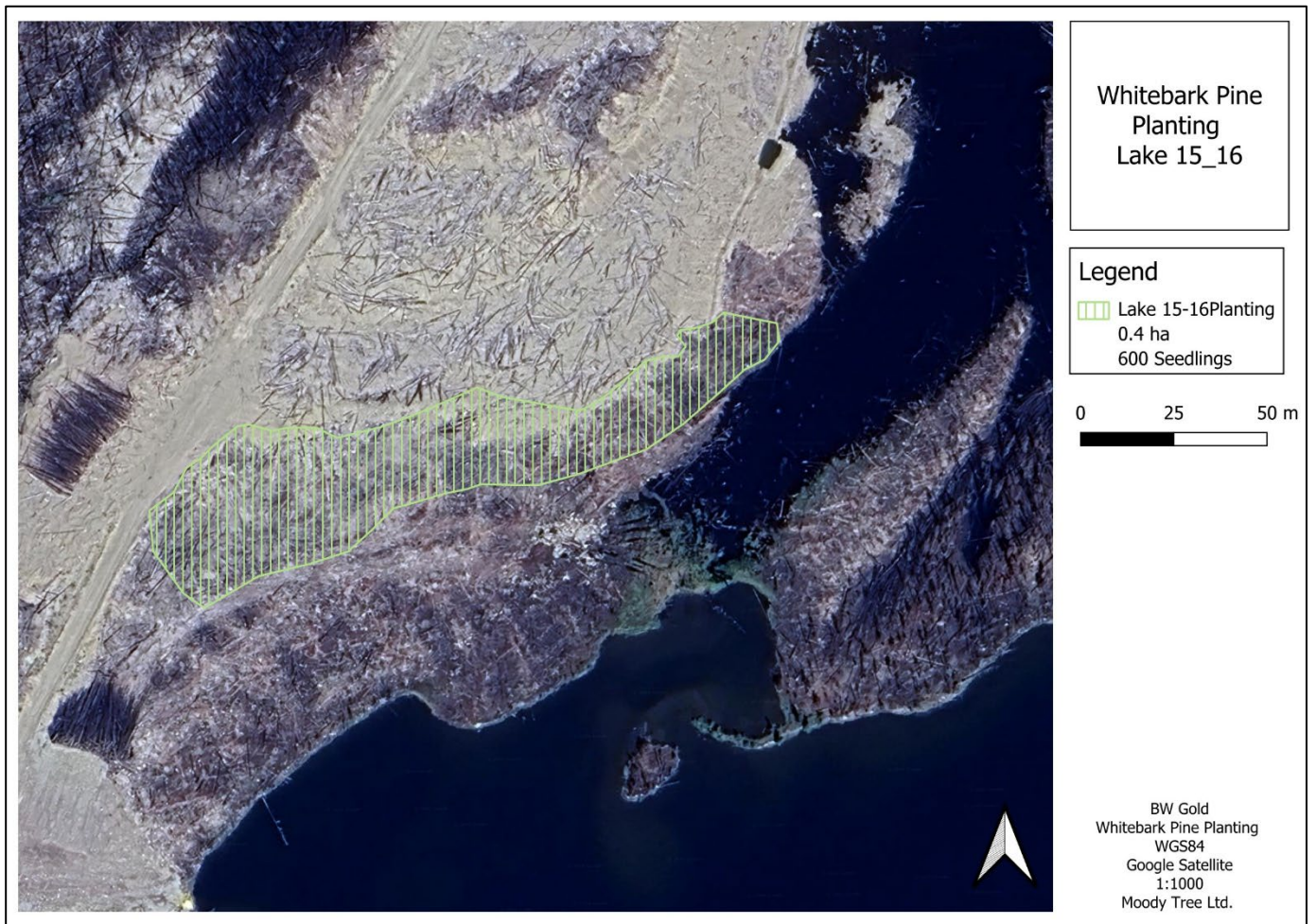
Since the planting implemented in 2025 was the first implementation of several plans, it is imperative that work continue to identify areas for future treatments and monitoring be conducted, to identify any success or failure signals, and adaptive management strategies be developed accordingly as per the Whitebark Pine Management Plan (BW Gold Ltd. 2022a). Monitoring should initially be conducted every year until seedling have established and then at longer intervals as per the management plan. Seedling are initially sensitive to site factors and early mortality will likely be a function of seedling health/quality or site stressors; once established, seedling decline or mortality will more likely a cause of extremes such as environmental extremes or infection by white pine blister rust.

5.0 References

- BW Gold Ltd. 2022a. Blackwater Gold Project. Whitebark Pine Management Plan.
- BW Gold Ltd. 2022b. Blackwater Gold Project. Joint Mines Act / Environmental Management Act Permits Application. Chapter 4" Reclamation and Closure Plan.
- Environment and Climate Change Canada. 2017. Recovery Strategy for the Whitebark Pine (*Pinus albicaulis*) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. viii + 54 pp.
- Farnes, P.E., 1990. SNOTEL and snow course data: describing the hydrology of whitebark pine ecosystems. In Proceedings—Symposium on Whitebark Pine Ecosystems: Ecology and Management of a High-Mountain Resource (pp. 302-304).
- Tomback, D.F. and K.C. Kendall. 2001. Biodiversity Losses: The Downward Spiral. Pages 243-262. In: Whitebark Pine Communities. Ecology and Restoration. Tomback, D.F., Arno, S.F., and Keane, R.E. (Editors). Island Press. Washington, D.C.

Appendix A – Planting Maps







Appendix B - Seedling Layout Matrix

Position	Line A	Planted Seedlings	Line B	Seedlings	Line C	Seedlings
1	D8	10	D4	10	3184	10
2	3176	10	3182	10	D6	0
3	D6	0	3179	10	D13	10
4	3184	10	D18	10	D16	10
5	3174	10	D5	10	D4	10
6	3185	10	D11	10	3185	10
7	3167	10	D14	10	3188	10
8	1208	10	3178	10	3182	10
9	D3	10	3193	10	D8	10
10	D18	10	D13	10	D1	10
11	3181	10	D23	10	D19	10
12	D12	10	3175	10	3178	10
13	3180	10	D12	10	3175	10
14	D22	10	3186	10	3193	10
15	3183	10	3177	10	D9	10
16	3192	10	3168	10	3192	10
17	3179	10	3190	10	3167	10
18	D13	10	3192	10	3189	10
19	3168	10	D25	10	39	10
20	3169	10	D8	10	3190	10
21	D5	10	3172	10	3186	10
22	D17	10	3189	10	3180	10
23	D2	10	3181	10	3168	10
24	3186	10	D3	10	3179	10
25	3191	10	3176	10	3169	10
26	D21	10	3191	10	D12	10
27	3177	10	3188	10	3183	10
28	D14	10	3174	10	3177	10
29	D24	10	D1	10	D25	10
30	3182	10	D22	10	3181	10
31	D25	10	D9	10	D7	10
32	D7	10	39	10	D14	10
33	3175	10	D2	10	3191	10
34	3178	10	3183	10	1208	0
35	3188	10	D7	10	3174	10
36	D4	10	1208	0	D11	10
37	3193	10	D20	10	D24	10
38	D11	10	D17	0	D5	0
39	3190	10	D16	10	D22	10

Position	Line A	Planted Seedlings	Line B	Seedlings	Line C	Seedlings
40	D9	10	D21	10	3187	10
41	3187	10	D24	10	D23	10
42	D23	10	3167	10	3172	10
43	3172	10	D19	10	D20	10
44	D16	10	3180	10	D18	10
45	D19	10	3169	10	D3	0
46	D20	10	3185	10	D2	10
47	3189	10	3184	10	D17	10
48	39	10	D6	0	D21	10
49	D1	10	3187	10	3176	10
Total		480		460		430