# MitoGrow™

## *Pellet3-IA Project for Salvaged Trees*

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**March - May 2017**

This project was completed in March 2017 using MitoGrow™ Pellet$_{3\text{-}IA}$ , an IBA and B1 pellet that stimulates root development and encourages growth in most species of plants and trees. Pellet$_{3\text{-}IA}$ was blended with three different fertilizers (8-8-8, 12-12-12, 10-8-0), creating three different Pellet$_{3\text{-}IA}$ /fertilizer blends. The blends were used to treat 201 salvaged trees in varying sizes from 24- to 98-inch sized boxes.

The tree species that were included in this project were Prosopis velutina, Parkinsonia floridium, Olneya tesota and Lycium. Trees in pods 1 through 3 were initially pruned, three weeks later were side boxed, then three weeks later were bottom boxed. Trees in Pod 3 were initially pruned, then both side boxed and bottom boxed within three weeks due to the project's time constraints. This is not standard operating procedure and presents additional stresses to the trees, increasing the probability of death. To rectify this, the trees were then moved to an onsite nursery location to be maintained for approximately one year before they will be replanted on site. The trees are all on drip irrigation and being watered on a regular schedule.

*Overall scope of the project representing around 60-70 percent of the total number of trees that were salvaged*

Application Methods:

1. Trench Method
   Grounded trees had trenches dug one foot from the expected perimeter of the box. Trenches were dug 1 foot wide by 1 foot deep. Pellet$_{3\text{-}IA}$/fertilizer blend was applied into the trench and then covered with 2 inches of soil. These trees were watered weekly. The intent was to leave the trees in the ground for a period of six weeks after the product was applied before side boxing. Due to time constraints, the trees were side boxed after approximately three weeks. Only 10-8-0 Pellet$_{3\text{-}IA}$/fertilizer blend was used in this application method.
2. Side Dress Method
   Boxed trees had trenches dug one foot from the perimeter of the box 4-6 inches wide by 4-6 inches deep. A layer of the Pellet$_{3\text{-}IA}$/fertilizer blend was applied and then covered with soil. All three fertilizers were used.
3. Top Dress Method
   After the untreated trees were boxed, the Pellet$_{3\text{-}IA}$/fertilizer blend was applied directly to the soil surface. Some trees were treated while only side boxed with the bottom roots still in the ground, while others were treated after reaching the onsite nursery location. 8-8-8 and 12-12-12 Pellet$_{3\text{-}IA}$/fertilizer blends were both used in this application method. Two application rates were used:
   - Two cups of the Pellet$_{3\text{-}IA}$/fertilizer blend were applied per one foot of box diameter.
   - Two cups of the Pellet$_{3\text{-}IA}$/fertilizer blend were applied per foot of box diameter and then covered with one inch of mulch. Thirteen trees were treated at 70 percent of these application rates to determine if a lower dose may be better on trees with newly cut roots to prevent burning of the trees.

Project Observations:

1. The trees that were treated with the Pellet$_{3\text{-}IA}$/fertilizer blend prior to digging exhibited a quicker spring leaf out than the other surrounding trees. Several of these trees showed little to no lateral root growth when the trenches were dug. One Prosopis v. succumbed, and the lack of lateral root growth in the ground may have been a factor.
2. Trees treated by top dressing leafed out with dark green foliage within two weeks of application. This was faster than the surrounding trees in the nursery and was evident from a distance by looking at the trees and seeing the pockets of green standing out amongst the other trees.
3. Many of the Parkinsonia f. that died or suffered dieback were dug when the temperatures first climbed into the high 90s. This combined with hot, dry winds and the trees being in full flower made these trees more susceptible to borer attack. This resulted in 80 to 90 percent of the losses seen in this species. Trees that were treated with the Pellet$_{3\text{-}IA}$/fertilizer blend did exhibit a lower loss, including the trees that were prematurely side and bottom boxed. Most of the Prosopis v. that died were all in 30- to 36-inch size boxes.
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5. All other trees were treated with the normal fertilizer/nutrient regimen used by the tree salvage operation. This regimen does not contain Pellet$_{3\text{-}IA}$. These trees did not show nearly as rapid response/recovery rate as those treated with Pellet$_{3\text{-}IA}$.
6. A number of trees with existing, heavy borer damage were treated with the Pellet$_{3\text{-}IA}$/fertilizer blends. They responded nicely to this treatment. This included many “blue tag” trees that originally were not intended to be salvaged.

*Treated (left) vs untreated (right) two weeks after application*

*90-inch boxed Parkinsonia f. four weeks after 8-8-8 Pellet$_{3\text{-}IA}$/fertilizer blend treatment, flowering again after losing flowers from the stress of hot, dry winds*

Conclusions:

1. Trees top dressed with the Pellet$_{3\text{-}IA}$/fertilizer blends yielded the best results.
2. Application of the Pellet$_{3\text{-}IA}$/fertilizer blend via in-ground trenching and application three weeks prior to side boxing led to no deaths among these trees. These trees were treated in the ground at what would have been 1.5 times the recommended rate had these trees already been fully boxed. The only tree in this group that died was treated at twice the recommended rate as if it had already been fully boxed. It is possible that if it had been left in the ground for the entire planned six-week period, this tree may not have died. Prosopis v. that were planted in 30- to 36-inch boxes had the highest death rates amongst the species. This may be due to the possible lack of lateral root development noticed during digging when trees were treated with the trench method.
3. Prosopis v. that were planted in 30- to 36-inch boxes had the highest death rates among the species. This may be due to the possible lack of lateral root development noticed during digging when trees were treated with the trench method. Timely insecticide application led to less damage and loss of trees due to borers.
4. Timely application of the Pellet$_{3\text{-}IA}$/fertilizer blend to the trees prematurely boxed appeared to have resulted in a lower death rate than otherwise would have been anticipated due to the overall shortened time frame between pruning and the digging and boxing of these trees.
5. Timely insecticide application led to less damage and the loss of less trees due to borers.

Recommendations for Tree Salvage Operations:

1. Apply Pellet$_{3\text{-}IA}$/fertilizer blend topically at a rate of two cups per foot of tree box diameter once the trees are boxed. Water in the Pellet$_{3\text{-}IA}$/fertilizer blend after initial application and continue to water the trees on an as needed basis.
2. For younger trees that may not have a well-developed root system, it is recommended that the trees are pretreated via the trenching method with an 8-8-8 Pellet$_{3\text{-}IA}$/fertilizer blend. This is likely to increase the survival rate of these younger trees by allowing them time to develop a stronger root system to better survive the stress of the tree salvaging process.
3. Monitoring for the presence of insect infestations of the trees and timely and proper treatment will help to reduce stress and/or potential death of limbs, as well as reducing the risk of death of the entire tree.