



IDENTIFICATION OF AREAS ILLEGALLY BAITED FOR WILDLIFE

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<http://www.the-whitetail-deer.com/whitetail-deer-doe.html>

Introduction

The baiting of wildlife for harvest is illegal in the state of Pennsylvania, as well as in 26 other states. The supplemental feeding and baiting of wildlife is suspected to increase the spread of disease (e.g., chronic wasting disease) and increase the illegal harvesting of wildlife species such as white-tailed deer (*Odocoileus virginianus*) and American black bear (*Ursus americanus*) (Dunkley and Cattet 2003, Brown and Cooper 2006, The Wildlife Society 2006). Commercial wildlife baits are readily available at common retail stores in Pennsylvania. Many of these baits contain ingredients such as sodium and calcium (Shaw et al. 2007), which may persist in the soil in ionic form.

The objective of our study was to conduct chemical analyses on soil where commercial baits have been applied in comparison to non-baited sites to determine if chemical signatures are left by commercial baits. We hypothesized that soils exposed to commercial baits would exhibit higher levels of sodium, calcium and chloride ion levels in comparison to non-baited soil sites. This would help wildlife conservation officers identify illegally baited sites.

Methods

Our study was conducted on the Millersville University Campus (Figure 1). The commercial deer baits tested for this experiment were 'Deer Cane' mixed by Evolved Habitats Wildlife Nutritional Products®, 'Acorn Rage' produced by Wildgame Innovations and '3 Day Harvest' by C'Mere Deer®. The experimental sampling design consisted of three sampling sites: 'Forested' area, "The Bush" biological preserve, and the third was within the gates of 'Roddy' pond (Figure 1). Each sampling site consisted of 3 baited and 3 non-baited soil patches for each bait type. Each baited patch and control patch were sampled 15 times every 2-3 days for 38 days.

Once all soil samples were collected, they were air dried and then sieved. To prepare samples for analysis with atomic absorption spectroscopy, 2mL of soil sample was mixed with 10mL of deionized water. Samples were then centrifuged at 3,000 rpm for 10 minutes and the supernatant was saved for analysis. Atomic absorption spectroscopy was used to measure the concentration of calcium and sodium ions in parts per million (ppm). Chloride ions were measured using a Chloride Probe from Vernier®. Ion concentration data was analyzed using a General Liner Model in MINITAB to compare sodium, calcium and chloride ion levels between baited versus non-baited soil (or control) patches, bait types and sampling sites.

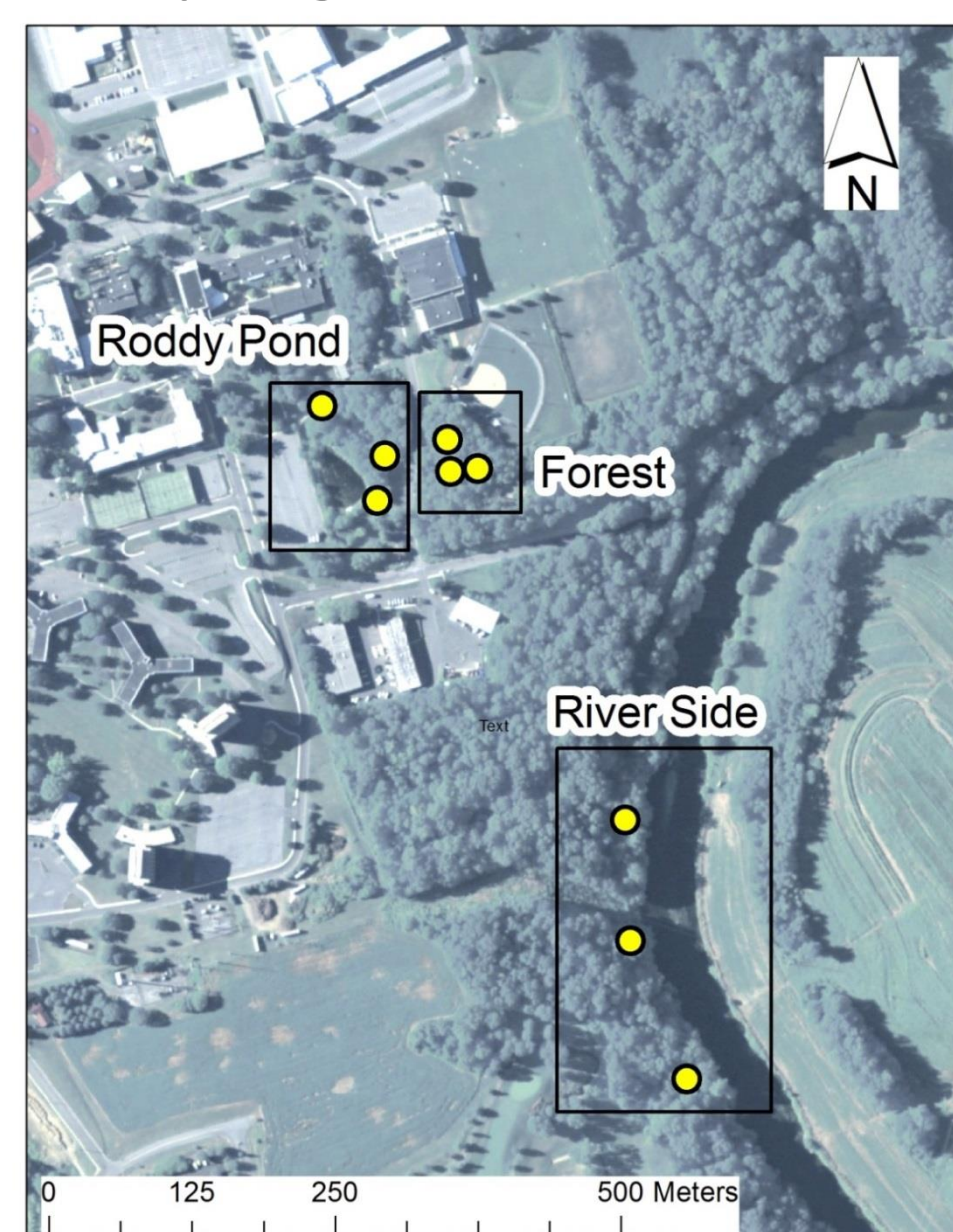


Figure 1. Map of soil sampling sites within Millersville University in Millersville, Pennsylvania. Each circle location consisted of soil patches with 3 non-baited and 3 baited sites with 'Deer Cane', 'Acorn Rage' and '3 Day Harvest'.

Results and Discussion

Based on the results of our General linear Model we found a significant difference in both sodium and chloride ion concentrations between the control and baited soil patches ($p < 0.01$) especially for the 'Deer Cane' and 'Acorn Rage' baits (Figures 2-5). For Calcium ions there was no significant difference between the control and baited sites ($p = 0.47$), indicating that Calcium was not a good indicator for detecting illegal baiting activity.

We did find a significant interaction between whether a site was baited or not and the type of bait that was used ($p < 0.01$). This interaction was associated with the '3 Day Harvest' bait where we found that there was no significant difference in chloride ions between baited and control sites ($p = 0.50$). We found sodium and chloride to be a clear indicator of baiting activity for both 'Deer Cane' and 'Acorn Rage' during the first 26 days in the field (Figures 2-5). Sodium and Chloride concentration in baited soil patches was significantly higher at all sites (Roddy Pond, Forest and "The Bush") compared to their associated controls.

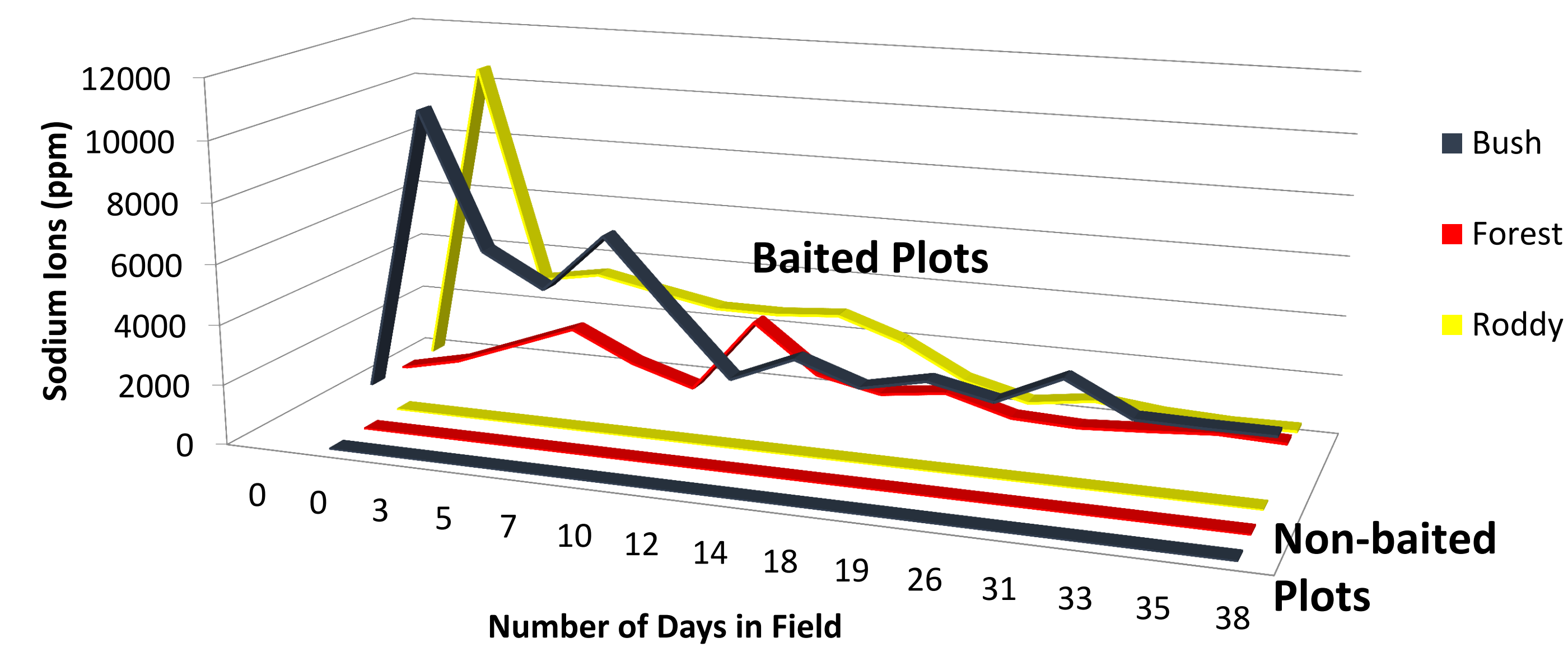


Figure 2. Concentration of sodium ions versus days in the field for soil baited with 'Deer Cane'. The initial day zero was immediately before 'Deer Cane' was applied to the soil patch.

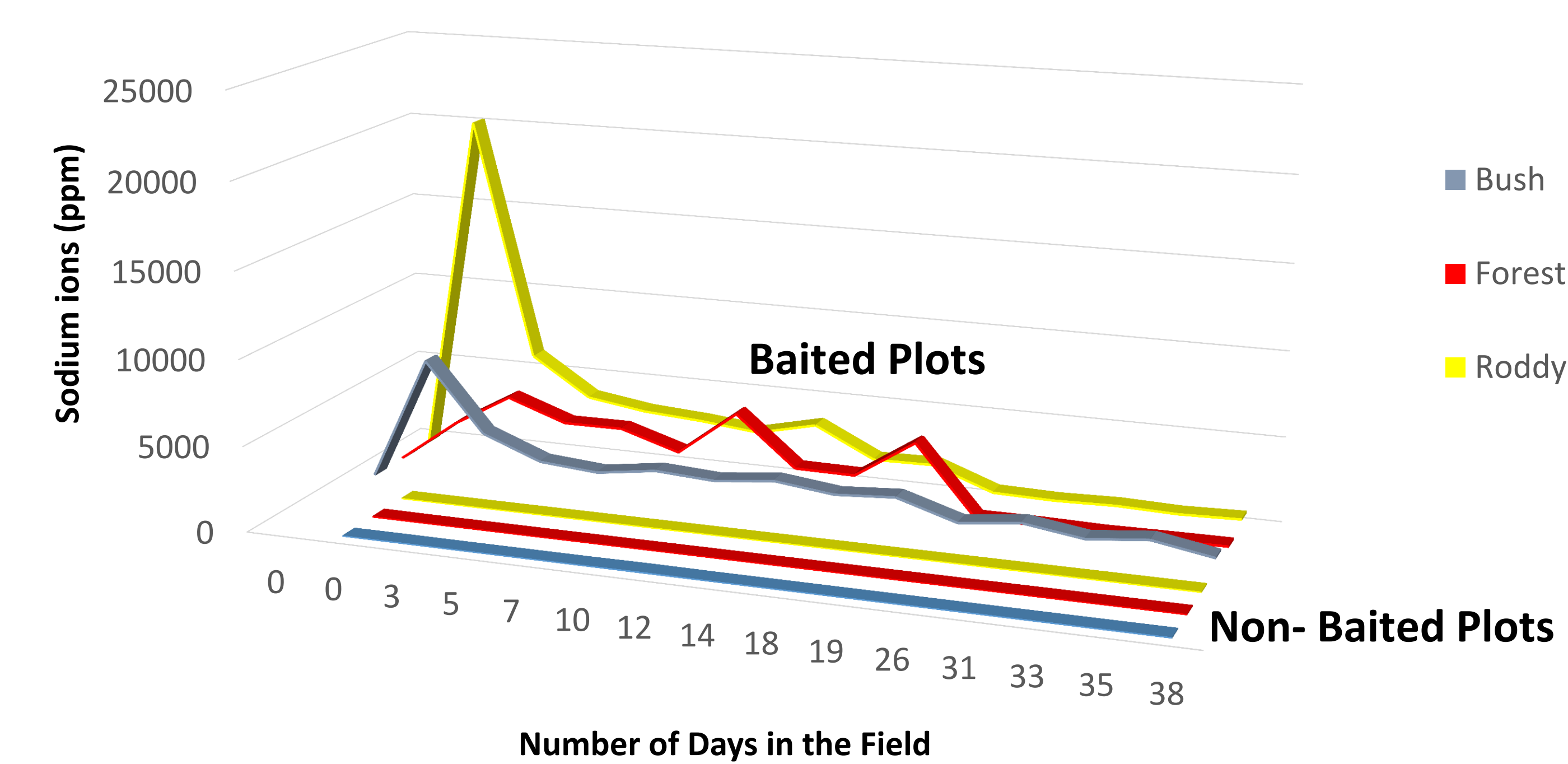


Figure 3. Concentration of sodium ions versus days in the field for soil baited with 'Acorn Rage'. The initial day zero was immediately before 'Acorn Rage' was applied to the soil patch.

Results and Discussion Continued

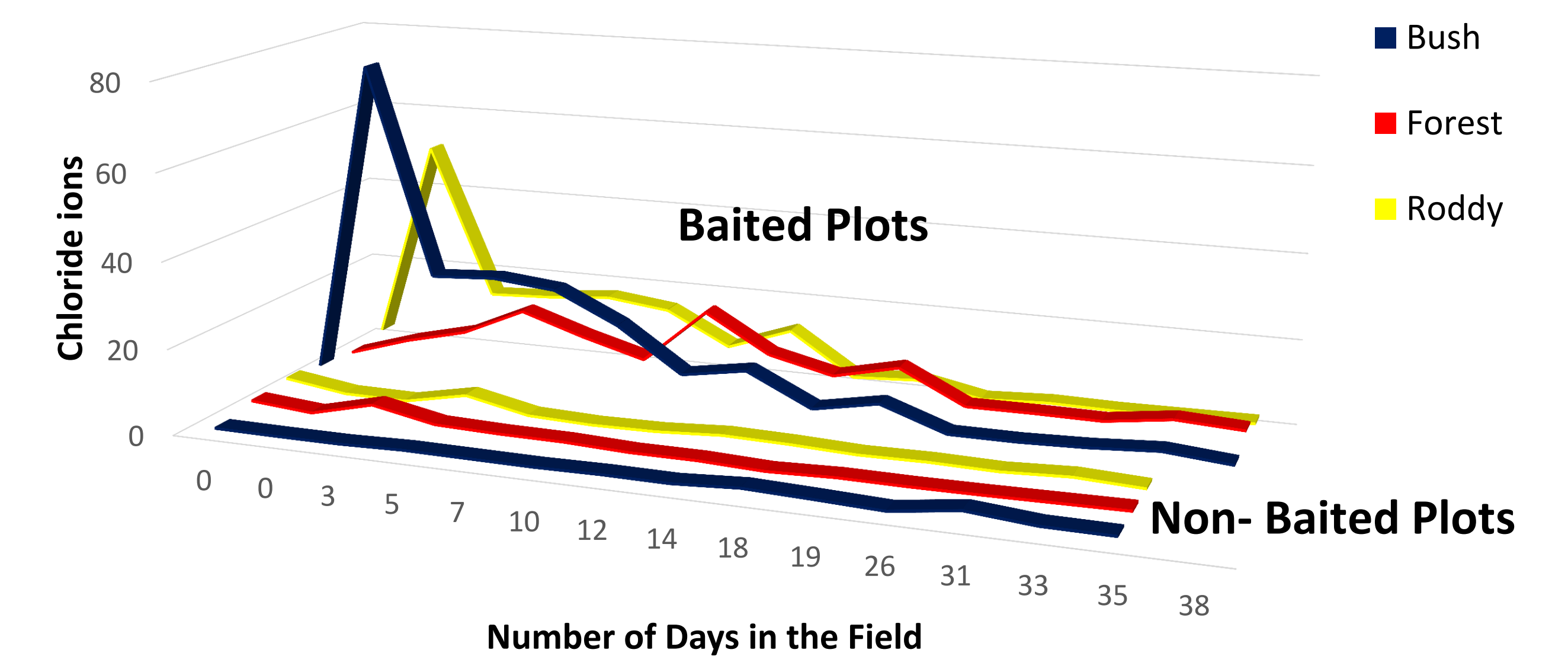


Figure 4. Concentration of Chloride ions versus days in the field for soil baited with 'Deer Cane'. The initial day zero was immediately before 'Deer Cane' was applied to the soil patch.

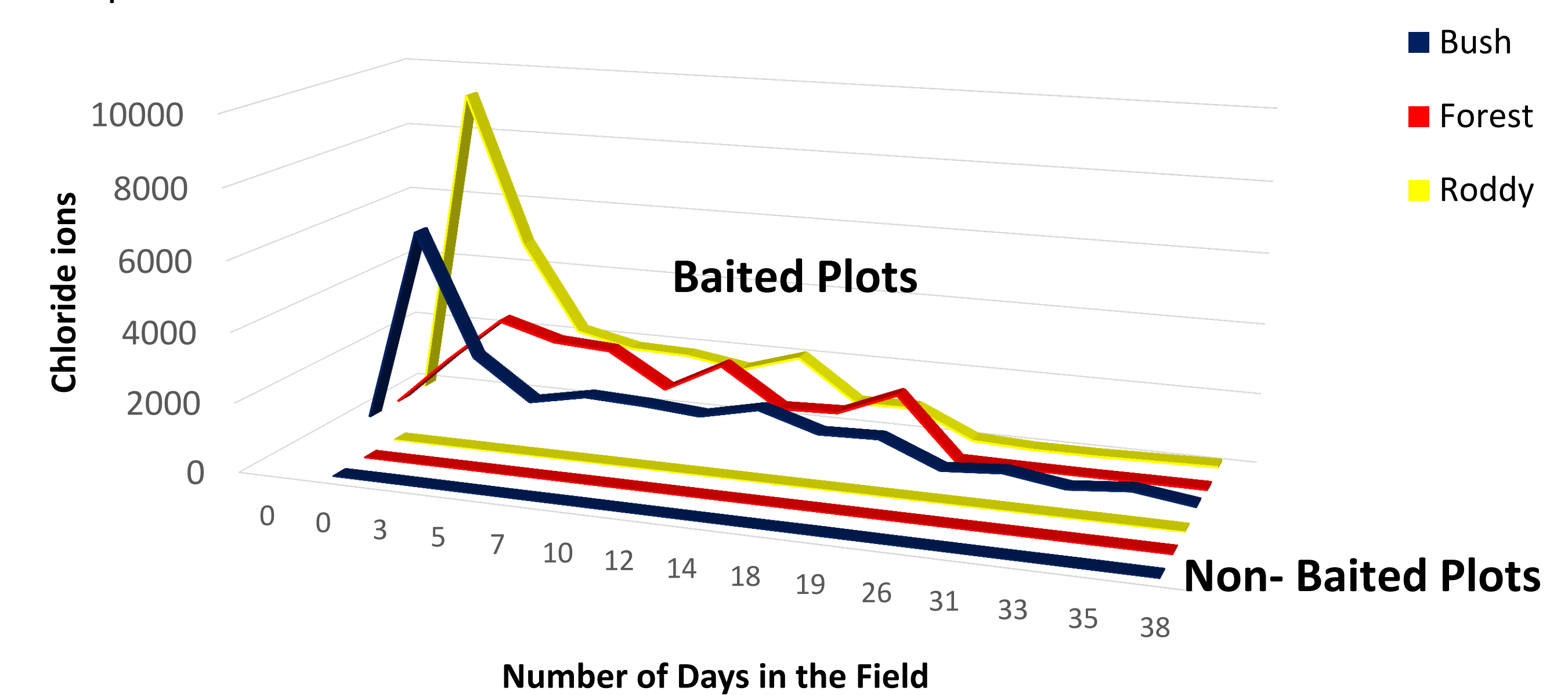


Figure 5. Concentration of Chloride ions versus days in the field for soil baited with 'Acorn Rage'. The initial day zero was immediately before 'Acorn Rage' was applied to the soil patch.

Our hypothesis was partially supported in that Sodium ions were a good indicator of baiting activity for all bait types and Chloride ions were also an indicator for 'Deer Cane' and 'Acorn Rage' bait. However, the next step is to identify simpler and cheaper field tests that could be used by Wildlife Law Enforcement Officers to identify illegal bait sites. Thus, future research efforts will include identifying cheaper tests to identify sodium ions and then compare these results to the atomic absorption spectroscopy.

Literature Cited and Acknowledgements

Literature Cited

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