CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)

Max J. Loewen

Project Number

36541

Project Title

Amendment of Playing Field Soil to Improve Soil Stability

Abstract

Objectives/Goals

My project was to determine if clay amendment can stabilize the soil and decrease soil displacement in front of a base when a player slides into it.

Methods/Materials

A soil collection frame was constructed and soil samples were collected for initial testing. The base path (area just in front of the base in line with the runner's path) was prepared using standard field technique: 1 liter of water from a pump sprayer to coat the top soil and smoothed with two passes of a field drag (or drag mat). The player completed 5 trials of a 40 foot running start and slide into the base. Soil displacement was collected after each trial using a flat head shovel and weighed. Soil was then returned to the base path. Two different amounts of clay kitty litter amendment were added to the top 3 inches of soil using a rake and foot tamp. With each change in amendment, soil samples were collected, the base path prepared using the water and drag method, and player sliding trials completed.

Results

The final sandy clay loam soil texture of 50% sand, 16.7-17.9% silt, and 32.1-33.3% clay had the lowest soil displacement and greatest stability. The initial sandy loam soil did not have enough clay to hold together when impacted by a baseball player's sliding friction.

Conclusions/Discussion

It is important to keep soil in place on a baseball field. Using cheap, natural clay kitty litter to stabilize the soil is a solution for schools that cannot afford name brand, expensive baseball additives or specially formulated field soil.

Summary Statement

I found a cheap, natural, and effective way to improve soil stability on a baseball field, and keep the soil where the players need it.

Help Received

I designed the project and built the frame with assistance from my parents. I researched soil field amendments online and at a local soil retailer, and received field preparation technique from a former baseball coach.

Preliminary