



Economic solutions and the environmental benefits at UC-Davis

>> **SPORTS TURF MANAGER MARK LUCAS** is part of a campus-wide sustainability effort at the University of California, Davis.

IT ALL STARTED IN 2008 with the economic downturn. Budgets were reduced and we laid off one groundskeeper on the sports turf crew. I didn't think the state level of funding would be improving in the foreseeable future. I also realized that my customers' expectations were not going to change like the value of my house. Most coaches' expectations would only continue to rise with every road trip to schools with larger budgets. The competition for recruiting athletes is impacted by our facilities.

With consideration for the budget and our needs for high-quality athletic facilities, I started out trying to find ways to maintain our

sports fields at UC-Davis with less funding. This is when I began to use organic fertilizer on our campus common turf area that we call the Quad. It is 5 acres and has very heavy traffic. Any given day we see hundreds of stu-

dents playing Frisbee, having lunch, relaxing, enjoying live music and holding rallies.

I wanted to see if we could achieve acceptable levels of turf quality with organic materials, building the soil for a more sustainable nutrient release. By feeding micro-organisms we are creating a living system in the soil that produces carbon, with an even flow of nutrients to the plant. We started using a bio-solid type (6-7-0) of fertilizer that is a by-product of sewage treatment. The results were very positive with just two applications per year the



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>> **EVERY COLLEGE TURF MANAGER** knows that facilities are very important in recruiting athletes.

quad had a deeper green color with good growth. This product is slow release because it's primarily non-soluble nitrogen and contains iron.

The next step was to begin using it on our recreational fields. On one of these fields we applied the bio-solid at 1 lb/1,000 sq ft rate on half the field and a more expensive bone meal, blood meal, feather meal animal byproduct type organic fertilizer on the other half of the field at the same rate. We deliberately left this field with just that one application for 1 year to examine the effectiveness of the two different products. It was very difficult to see any big difference between the two sides of the field. The notable thing for me from this little experiment was that neither side of the field showed significant change in growth and color until late in the 10th month. I'm not saying we should fertilize once a year but I was trying to quantify the value of these products, because the cost is not the same for each.

One problem with the bio-solid type is that it has no potassium and excess phosphorus. When used in expansive soils (sandy soil or soils that freeze and thaw) it can leach phosphorus into ground water. We countered the potassium problem by blending the bio-waste with a chicken manure 3-2-3. The leaching problem was addressed by lowering the rate and increasing the frequency.

In our part of the country we don't have serious problems with leaching, our soils are heavy with silt and clay and we don't expe-



>> **BUDGET CONCERNS** led to using organic fertilizer products.

rience ground freezing or snow. We are now fertilizing all of our fields with this blend. This includes the athletic game and practice facilities that are hybrid bermudagrass. Timing of applications can be critical due to the nature of the product. Soil temps must be high enough to digest the material into a usable form (nitrate) for the plant.

I like to do my last applications in mid-fall and the first in mid-March. This helps to eliminate leaching and the waste of money.

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>> BY FEEDING MICRO-ORGANISMS Davis was creating a living system in the soil that produces carbon, with an even flow of nutrients to the plant.

We fertilize the high use athletic facilities every 6 weeks at low rates and recreational fields three to four times per year. What drove me to this program is the high costs of synthetic fertilizer. As the price for oil climbed higher the price for petroleum-based products like synthetic fertilizer also rose. I found a great savings for our shrinking budget and it came along with environmental benefits.

SAVINGS ON PAINT

Another high cost area of athletic field maintenance was our paint budget. Along with that were many environmental concerns. We use more than 1,000 gallons of paint each year. We had local contracts for paint that is produced in the Sacramento area. As paint prices increased I started to search for paint that is designed specifically for athletic fields. I found that for a small percentage more I could purchase athletic field paint designed for painting on turfgrass. Although this was great field paint I was still concerned about the release of volatile organic compounds (VOC) being allowed into the atmosphere. I was also concerned about long-term effects to ground water using this type of paint product. In addition the product comes in 5-gallon buckets. After several years we had an abundance of these buckets. The bucket is another petroleum-based product that I had trouble finding ways to recycle. I checked with our campus recycling and refuse supervisor and found no way to recycle, other than to reuse of the buckets.

Then I discovered a paint manufacturer, Eco Chemical, which was developing a new paint product that could be shipped in a box instead of a bucket. This product is in two parts, a paste and a powder; you just add water and mix. The paint is shipped in a cardboard box that weighs 25 pounds. Each box can make up to 20 gallons of paint. One pallet of this product is equivalent to 900 gallons of paint. The environmental advantage is less container

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>> **BOXED PAINT** saves Lucas storage space and eliminates having to dispose of old buckets.

waste and lower shipping cost. Most importantly this paint contains no VOC's.

UC-Davis was selected by this company to do some early beta testing of this product. We used this paint in comparison with two other products on our athletic fields. In addition we did some side-by-side line testing on a field. In some of the line tests we also mixed a plant growth regulator to suppress growth of the turf, al-

lowing the paint to last longer. The athletic turf paint looked a little bit brighter than the other paints in the beta test. Over 1-week duration the differences were only slight. After the beta testing some adjustments were made by the manufacturer to allow brighter pigments. We did not have any problems with clogged nozzles.

We found that the new product is compatible with a plant growth regulator and we use it for several different applications to use less paint and therefore less labor. We can store a 1-year supply in a small area, about 20% of the area of the 5-gallon buckets. This paint has a longer shelf life, because it is in a dry formulation. We have found that even after 2 years the paint is still just as effective as with first shipped. We have also noticed less build-up in the soil at the crown of the turfgrass plant, as compared with the traditional paints we used in the past. I would like to see some scientific studies of this aspect to confirm our observation.

In summary it is important to look at the systems we use daily and how they impact our budget and environment. By using the more eco-friendly products for fertilizer and painting it has reduced not only our budget but also labor spent to achieve the same quality for our athletes. These are only two examples of the many things we can do to work toward a more sustainable future in sports turf management. ■

Mark Lucas is sports turf manager for the University of California, Davis.

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