Ground Changing Factors

By Laura Lambert with Safe Arena Footing

There are many factors that go into the production of a rodeo and the conditions provided to the contestants and committees. Ground is just one of the many concerns facing the people producing the rodeo and it certainly would be nice if they could just prepare it once and forget about it, as they do many other things. Unfortunately, ground is something that requires almost constant monitoring.

The proper mix of materials allows for stock to dig in as well as push off the ground while running or bucking.

Mix of Materials

Of the many things that affect the ground at the facility, the first thing you should be concerned with is your mix of materials. It seems that with today’s technology, we should be able to be more consistent in arena performance from coast to coast. The only way to make this happen is with soil testing. You need to know what makes up your ground before you know what steps you should take to improve it.

There are three major factors in the mix of materials: sand particle size, sand distribution – uniformity coefficient, and clay content. Silt is a more pervasive constituent, misused, and misunderstood, as it has no real benefit unless clay is not available. All of these factors will affect your grounds performance and consistency cannot be reached without the knowledge of these factors.

When the required testing is complete, the main focus should be the indication of the soil’s shear strength. The impact of shear strength focuses on usage and reduction of injuries to livestock. Shear strength is a term used in soil mechanics to describe the magnitude of the shear stress that a soil can sustain. The shear resistance of soil is a result of friction and interlocking of particles, and possibly cementation or bonding at particle contacts. Shear strength can be measured directly or by evaluating the factors that affect shear strength.

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**Down & Dirty With The Pros**

**Part 1 of a 2 part series**

*Randy Spraggins is a PBR associate and contractor that handles the majority of ground prep for PBR events. Randy is no stranger to tight time constraints, indoor arenas and manipulating a variety of dirt from across the country.*

WPRA: In your work with the PBR, how much time do you have to prepare the ground before an event?

In most cases, dirt moves into the arena between 1 and 6 pm the day before an event. We do sometimes have a day or 2 to prep the dirt before it actually gets delivered to the arena. That depends on the weather or other factors, such as having to dry out or pre-water the dirt. We do have a lot of stockpiled material saved for each venue; once we find good dirt and make any amendments to it we keep it for future use.

WPRA: Can weather affect the ground at an indoor event?

Absolutely! Being indoors has an effect on the ground conditions if say we are over ice, the humidity levels and air conditioning systems can come into play. If it’s real cold outside, which our early season events are in colder climates, just having the doors open to get the stock in the building can have an adverse effect too!

**Justin Best Footing Spotlight**

*With Kris Beckstead, That Famous Preston Night Rodeo*

Several years ago, we had footing problems and determined much of it was caused by a hard pan a few inches below the top soil surface. It was then that we started a deep digging process to break up that hard pan. Our process starts two months prior to the rodeo:

- We dig the ground 8 to 12 inches deep. Loosening the soil eliminates the hard pan to that depth and aids in drainage.
- We also dig the arena at various angles to eliminate high and low spots.
- While the soil is loose, we add water. The amount depends on outside temperature, wind, soil type and other weather conditions.
- The final step is to work the arena with a quality arena groomer; we use a Black Widow 10 foot groomer. The Black Widow has teeth in the front to loosen the packed soil (from the water truck and tractor tires), a leveling bar, and beater baskets on the back to break up clods and firm up the soil.

We learned all of this by trial and error! Arena dirt is one of the most important aspects of a good rodeo. There are no short cuts to developing good ground and it’s a commitment of time and proper capital investments. It is a science and once you have found the formula, keep it going!

We believe good ground is one of the main reasons contestants want to come to The Preston Night Rodeo. The Justin Best Footing Award has made us more aware of the importance of proper soil maintenance and has validated the expense of the equipment used and the time devoted to the soil. We are proud of our rodeo and receiving the footing awards has made us strive to continue to be a top quality show.

**Ask The Expert — Brought To You By SPI Insurance**

**Question:** What tools are on the market for me to test the moisture content in my ground?

**Answer:** You can test your ground using a moisture probe and there are many types on the market. One of the most accurate portable soil moisture measurement devices is the Speedy Moisture Meter. Secondary to that are domain reflectometers (both TDR and FDR). When using domain reflectometers, it is important to use the sole of a boot to compact the soil at the place of probe instrument in order to get a more accurate reading as fluffy/low density soils do not give a good reading. You can find these tools online from construction testing equipment companies.
Committee Talk

With Dona Vold from Triple V Rodeo

While I believe the Rodeo Committee, the Rodeo Contestants and the Stock Contractor, are the three most important components to putting on a first class rodeo, I also know that the facility and the ground are important in making a fair, safe and exciting rodeo.

As you know, Rodeo Committees and Stock Contractors are tasked with keeping the ground safe and consistent performance after performance. That means it needs to be right for the bucking stock, the timed events and the barrel race. In addition, many rodeos have other events such as concerts and demolition derbies. So ground and its preparation is a pretty huge responsibility and no easy feat. And nothing scares a Stock Contractor more than bucking an outrageous horse or bull in really deep, slick ground, having them go down or having barrel horses stumble or fall.

From my view, ideally the barrel pattern should be far enough away from the bucking chutes, which is tough in small buildings. The arena surface has to be level and not too deep. But the real bottom line is that Rodeo Committees and Stock Contractors have to work together to evaluate and prepare the ground as best as it can be for the geographical area where the rodeo is held. The ground varies so much from location to location: the Sand Hills of Nebraska are different than the Rocky Mountain tops of Colorado and the Gumbo Hills in Montana.

Remember no Rodeo Committee or Stock Contractor sets out to have less than perfect ground.
The WPRA is pleased to bring you these educational materials. Because the WPRA is primarily a sanctioning body, not a producer itself, it does not control the makeup or preparation of specific ground at specific events. Because safe ground is in everyone's interest, the WPRA encourages you to contact the individuals and entities above for more information.

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Consistency of the mix of materials and depth should be considered as well. Compaction depth can vary throughout a facility therefore, a level base layer, sub-cushion and cushion should be the ultimate goal.

Water

Water is the next factor that can and will affect the quality of your ground. This is a variable in all arenas due to the varied construction materials and mixes. The location of your event will also play a significant role in both the amount of water required and retention: indoor versus outdoor, the local environment, type of ventilation, how long your event will go, and what disciplines are being entertained.

How rapidly the ground dries out during the event is also a large factor as performance characteristics can change dramatically with moisture variation. In response to this, a venue should certainly have a basic soil moisture meter. The producers should understand both the soils moisture levels at which the ground performs best and also monitor conditions for when and how much water to apply when the ground begins to dry out.

The quality of water can also affect the performance of the soil. Water should be tested for hardness, salts, sodium, pH, sulfides, carbonates, and bi-carbonates.

Indoor vs Outdoor

The same problems exist here, as far as materials of construction with no consistent recipe or specifications. Indoor versus outdoor should basically be treated the same with the exception of consideration of local weather conditions outdoor. The materials of construction should vary slightly in particle size, the amount of clay (and other water retentive amendments), and targeted percentages. Drainage on an outdoor arena is a major factor. A good question to be answered here is how soon after a one inch rain would you want to ride?

Ventilation should also be considered as a factor affecting moisture content and performance. You should check ventilation from A/C vents, overhead fans, and cross ventilation for localized (spot) drying.

Equipment

In today's market, there is a multitude of implements available to work the ground. Much of what is offered is good. Typically cost is the main factor considered when purchasing a piece of equipment for use; however, for producing consistent footing, performance of the equipment should be the main consideration. At a minimum, an arena should have a tractor with 30+ horsepower, a ripper or harrow, a water truck or some method of irrigation, and a drag (mat or chain link).

Equipment should be checked and evaluated on a regular basis. Things such as correct tires and tire pressure, along with even harrow length should be considered. It is also very important that the equipment being used to prepare the ground is being operated properly. Again, there are several factors that will affect the performance of the equipment including speed, proper brake assist for turning, proper harrow depths, weight and draft controls.

Conclusion

As we can see, ground is a complicated issue that can be made much simpler with the use of testing. Committees and producers can eliminate the guessing game by employing soils and water testing. Safe Arena Footing offers all of the testing processes needed for evaluation and prescribe techniques for your ground. After the knowledge is gained, ground should be prepared as prescribed and as far in advance as possible using proper techniques and equipment.