APPLICATION ADVANTAGES OF HOMOGENEOUS PELLET FERTILIZER

In today's market, professional turfgrass managers, golf course superintendents and landscape managers have basically three types of dry fertilizers from which to choose: (1) homogeneous pelleted fertilizers which have excellent uniformity; (2) blends of two or three homogeneous pelleted fertilizers that contain different plant food nutrients which are nearly as uniform as 100% homogeneous pellets; (3) granular bulk blend fertilizers which are a non-uniform mixture of several different materials and are subject to segregation and uneven application.

Uniformity most important

It is often very difficult to achieve uniform distribution of granular blends. Non-uniform application can be very frustrating and unsightly on turfgrass and extremely devastating on the intensely managed turfgrass of golf course greens and fairways. With granular blends, you have three forces working against uniform distribution – (1) coning segregation, (2) sifting segregation, and (3) ballistic segregation.

Coning segregation

Granular blends are a mixture of several different materials with particles of different shapes, sizes and density. If you pour a mixture of these kinds of materials into a pile, such as would be done in bulk storage or when loading into a spreader, the heavier more dense particles will tend to go to the bottom and edges of the pile, while the lighter, less dense particles will tend to accumulate in the center of the pile.

Actual case history

Figures I to IV show the results of coning, sifting and ballistic segregation on an actual order for two tons of a 20-10-5 analysis dry bulk blend fertilizer.

Figure I, samples were collected upon loading from under and from the top and from the bottom corners of the applicator. The analysis are shown none was 20-10-5.

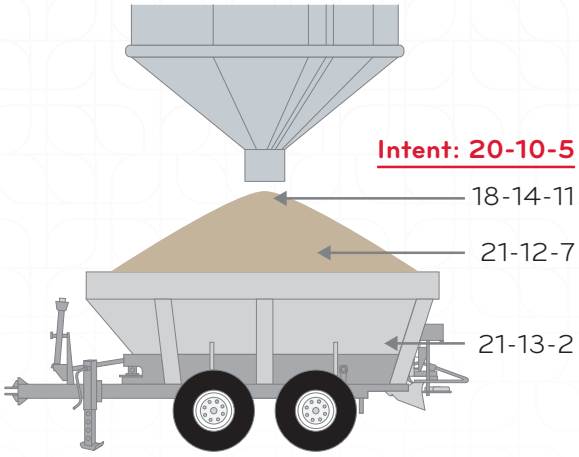


Figure I. Coning Segregation

Sifting segregation

As the granular blend is transported over the road or rides in the spreader, the bumps, jolts and vibration of travel will sift and separate the different materials. Again the more dense particles tend to go to the bottom and edges of the load. This sifting can also occur in granular blends which have been bagged and shipped relatively long distances by truck or rail. In Figure II, samples were collected from the top, from 12 inches under the surface and from the bottom when the applicator arrived in the field. Again, no sample was 20-10-5 in analysis . Additionally, the analysis show movement of phosphate to the bottom and potash to the top.

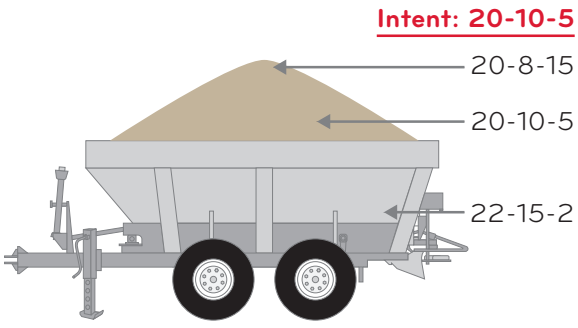
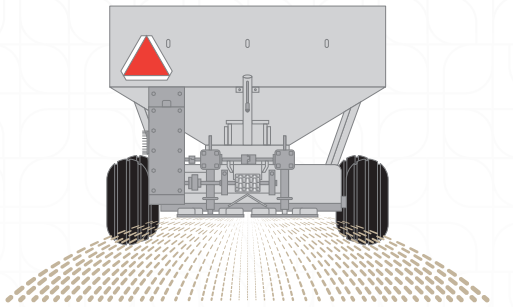


Figure II. Sifting Segregation

Ballistic segregation

As the granular blend is applied to the turfgrass of landscaped area, the spinner tends to throw the more dense, heavier particles a greater distance than the less dense, lighter particles. In other words, the spinner further segregates the granular dry blend in addition to what happened in storage, loading and moving down the road. If the blend is made from materials that differ widely in particle size, the separation can be severe, resulting in uneven application of nutrients across the swath.



Uneven distribution in spreading

Actual field measurements have shown a variation of from 50% to 225% of the recommended amount of dry granular blend fertilizer, all in the same swath, as a result of the forces of segregation.

With the use of collection containers in the field, the dry bulk blend was analyzed which was thrown by the spinner into each container. Figure III shows the analysis of the fertilizer collected in each container. The analysis varied from 22-9-9 to 19-17-4 within two swaths of the applicator.

Figure IV shows the weight of fertilizer collected in each container on a pounds per acre basis. The application varied from 101 pounds to 390 pounds per acre with the two application swaths. Uniform distribution with dry bulk blends is extremely difficult to achieve, if not impossible.

Nutrient interaction

Research has shown that the maximum influence of nitrogen occurs when the nitrogen and phosphate are intimately associated together. This kind of chemical combination is found only in homogeneous pellets or high quality pellet blends. If the nitrogen is separated from the phosphorus by as much as two inches, there can be as much as a 50% reduction in phosphorus uptake by the plant. The agronomic advantage is called Nutrient Interaction. Likewise, there is a positive interaction between nitrogen, phosphorus and sulfur in increasing the availability and efficiency of each of these important turfgrass nutrients.

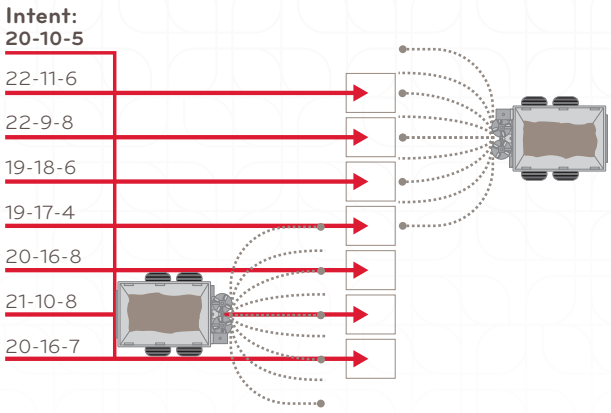


Figure III Ballistic segregation of analysis

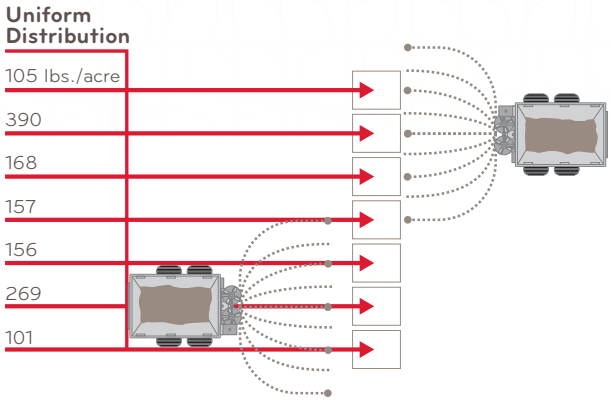


Figure IV Ballistic segregation of weight

Summary

Granular dry blend fertilizers are mixtures of particles of different sizes, shapes and weights. The forces of segregation add to the non-uniformity of blends of this type. Uniform application becomes extremely difficult. Uneven distribution of nutrients even within the same spreader swath can result in uneven growth, lack of uniform color, and increased management problems. By contrast homogeneous pellets or high quality pellet blends provide for even application and increased nutrient efficiency through positive nutrient interaction.

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