

29 [Jan/Feb]

**There is always an answer
if we follow the path that *useful science* leads us down**

Recently I had occasion to go back and look at some of the reports that I had written some 20 years ago, and in so doing realized how far we have come in regards to *useful science* since those early days in regards to the physical properties of sports turf root zones.

In the early nineties we assumed that the larger the tine hole we punched in our greens the more effective the process of aerifying would be. I wrote reports in which I stated that because of the condition of the root zones, we needed to use $\frac{3}{4}$ & 1 inch hollow tines to start on the path to a balanced [physical properties] root zone. **BOY** was I ever wrong. I would like to take this opportunity to apologize to every superintendent that followed the industries and my traditional thinking that the bigger the hole the better.

During that time in the early nineties I presented an ISTRC physical properties report to a superintendent in the New England area of the United States. His comment to me upon my finishing my diagnosis was that it was the most comprehensive physical property's report that he had ever read, but that it was totally useless to him in the *real world*. The report indicated that he needed a displacement of 20% of surface area to a depth of 3 inches over the next 12 months to begin the reconstruction effort, which his greens needed. With the equipment he had at that time this would require 6 disruptive aerifications [*In the early 90's most aerification equipment had fixed spacing*] which was totally unacceptable for the club and its members.

The realization that there was a tremendous gap between scientific data and real world application hit me rather hard, to say the least. The line of thinking [*Science-Research*] that followed to solve this dilemma was to reduce the spacing between the holes which would result in greater displacement using the same size tines.

EXAMPLE: $\frac{1}{2}$ INCH HOLLOW TINES ON 2.5" SPACING = A DISPLACEMENT OF 3.14%
 $\frac{1}{2}$ INCH HOLLOW TINES ON 1.5" SPACING = A DISPLACEMENT OF 8.73%

This *science-research* and the embracing of smaller spacing between tines led to a revolution in our thinking of how to use the tool of aerification to help achieve balanced physical properties. I believe that you would be hard pressed today to find a piece of new aerification equipment that does not have variable spacing. What led to this industry change? *Science Research* based on need from the real world would be my guess.

This *science- research* has allowed us to understand that we can use smaller tines on tighter spacing and achieve better results in regards to displacement amounts, with less heal time, resulting in **less lost** cash flow due to the heal time of the holes.

By conducting *science- research* on bent grass greens in the Midwest part of the United States we found that by using $\frac{3}{8}$ s and $\frac{1}{2}$ inch tines on tighter spacing we displaced almost twice as much material and reduced heal time for the holes from 10+ days for $\frac{5}{8}$ s inch tines to less than 6 days for the smaller $\frac{3}{8}$ s and $\frac{1}{2}$ inch tines.

5/8 " tines on 2.5" spacing provides a displacement of 4.91% and 10+ days for heal time [Average]

½ " tines on 1.5" spacing provides a displacement of 8.73% and less than 6 days heal time [Average]

3/8" tines on 1.25" spacing provides a displacement of 7.07% and less than 6 days heal time [Average]

Science Research based on real world needs is helping us in the sports turf industry to provide better playing surfaces at less cost than just five short years ago. Maybe one of the most exciting **science-research projects** for us now and in the future is the injecting of oxygen through the gravel of our greens and athletic fields up into the root zone, enabling our plants to breath.

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