

# 'Tuning' the soil

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the soil's Total Base Exchange Capacity. When this value is known, the soil may be restored to ideal balance for all nutrient elements necessary for optimum yields and a quality crop. The firm's spokesman also noted that a soil can get worn out after years of cultivation, and maintaining high productivity requires rebuilding and restoration practices.

During a question and answer period following the meeting, which took place at the Willow Valley Restaurant, here, Boehle and Campbell both commented that similar points regarding proper balance of ingredients can also be made for feed rations. They stressed a firm belief that soil, plant and animal nutrition are interrelated and there is often just a "fine line of tolerance" between them. "Working with it is like tuning a car," Campbell said.

The physical properties which have a pronounced effect on productivity and fertility include the surface condition, such as deep ruts and large clumps. Deep ruts severely damage the soil's structure and bring about imbalances within the delicate living system, Boehle explained. Large clumps, especially those which are a common occurrence on clay soils, make it difficult to work the soil properly, and also bring about imbalances.

The hard pan, or "plow sole," as has been mentioned before, is a physical property of the soil which has much to do with the movement of water within the soil. Research at universities and at Brookside Farms has illustrated that water moves through soil via capillary action. It will not move through soil particles, but rather around them. To insure good capillary movement of water, the soil particles must be of uniform size, Boehle commented.

Another point made at the meeting, which was attended by approximately 50 of Brookside Farms' clients in Lancaster County, was that Calcium levels have an effect on how well water and roots penetrate the soil. According to Boehle, Calcium allows for better root and water penetration.

"How about 'green manure' crops," asked one of the men in the audience, "what value do they have in building up the soil?"

"Very little," came Boehle's reply. He explained that to

build humus the soil's organisms need lignin, a constituent of plants which can only be found in mature plants.

In another segment of the meeting, Boehle revealed that the amounts of animal manure spread onto a field must also be taken into consideration in assessing a field's potential for growing crops. Likewise, the farmer must consider what he takes off the field. Corn silage, for example, takes about 60 per cent more out of the soil than

*"Working with nutritional programs for the soil, plants, and animals is like tuning an automobile.*

*Sometimes the lines of tolerance are very fine."*

does ear corn. It therefore becomes more essential to spread manure on fields where little or no crop residue remains after harvest. The soil analyst emphasized that corn silage after corn silage for a number of years will

deplete soil organic matter rapidly, but such a cropping program isn't harmful as long as the soil is properly managed.

Although the ideas presented by Brookside Farms personnel are relatively novel when compared to farming practices which have dominated this country's agricultural scene for decades, some of the practices recommended by the firm may require some farmers to take a step into the past.

The idea of getting back to straw for bedding material is one example. In recent years the trend has been towards free-stall barns, slats, rubber mats, and even carpeting.

Manure without straw concentrates salts (Potassium and Phosphorus) and will hurt the farmer in the long run, warned Campbell. Such over-concentration of phosphorus and potassium can affect the entire soil system and lead to an increase in soil, plant, and animal health problems, he cautioned.

The soils consultant, (Campbell) appeared to have struck a sensitive chord when he linked animal health problems with soil conditions. A number of questions were raised, all of them expressing concern over proper soil management, especially as it relates to animal health.

According to Campbell, some significant problems have begun to surface on European farms where some of our new systems for handling and housing livestock were first tried. He is convinced that many of the animal health problems are due to excessive concentrations of animal manure and the resulting imbalances in the soil, the plant, and animal body. "Excess amounts are worse than deficiencies," the elderly veteran agronomist stated. Too much manure on a field and poor animal health go hand-in-hand, he affirmed during informal questioning after the program.

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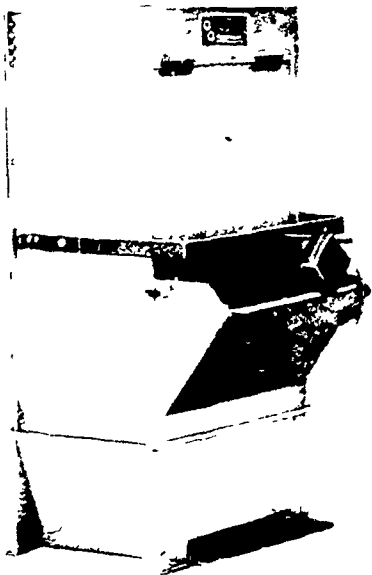
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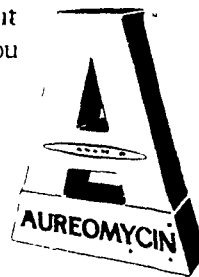
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