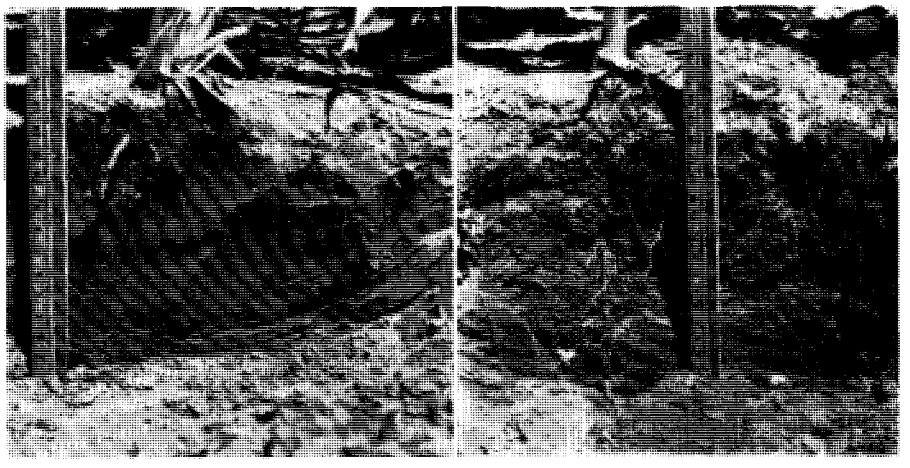
Ag and Food Interprets . . .

- **Fertilizer placement gets research attention in South and West**
- **Could manufacturers cut down number of fertilizer grades?**
- **Russians report at Geneva on application of radioactivity to ag research**
- **Fertilizer situation indicates U. S. soon to become net exporter of potash**
- **Ultrasonics in food processing may be underdeveloped and overpromoted**

Fertilizer Placement

Trend is deep placement in South, while research activity is picking up in West



Results obtained in Florida from subsoiling and deep placement of fertilizer. Left: No root growth below top six inches without subsoiling and deep placement. Right: Increased root growth obtained when subsoiling was used and fertilizer was placed in bands to the left and right of the bottom end of the ruler

A "REFINEMENT IN TECHNIQUE" is perhaps the best description of recent advances in fertilizer placement. Experiment station workers in most sections of the country have been recommending for some years a number of different techniques, all of which are essentially variations on time of application in relation to planting and on location of the fertilizer in relation to the seed.

Although no startlingly new techniques have had an impact on the industry in recent years quite like the injection of anhydrous ammonia (first in irrigation water in the 1930's and later directly to the soil), importance of fertilizer placement research is not being overlooked. Most of the work on fertilizer placement seems to have been done in the South and Southeast in the past, understandable in view of the longer history of fertilizer use in those regions. Most widespread current interest seems to be in the West.

But while research activity on placement may not be working great changes east of the Rockies, experiment stations there have not abandoned such projects. Closest approach to a research trend is work in the South on deep placement. In North Carolina, for instance, attention is directed to how deep placement may affect root activity and uptake of nutrients as compared to fertilizer restricted to the soil's top four to six inches. Evidence to date shows deep placement gives better root systems and perhaps facilitates better use of water at greater depths.

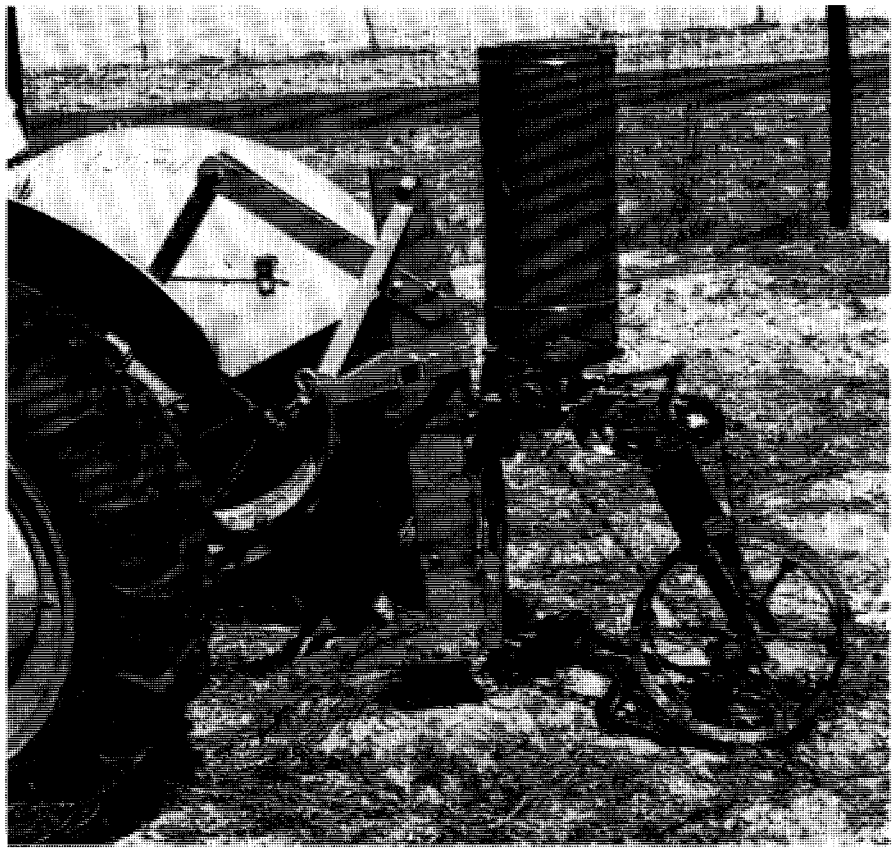
In Florida, meanwhile, where the growing season for important cultivated crops is usually punctuated with dry spells and where soil fertility is low, deep root penetration is desirable if best use of nutrients and water is to be obtained. In heavier soils of western and northern Florida, compact zones form near the surface and prevent or retard root penetration. These may be the result of plow soles developing over a period of years from frequent cultivation or from clay accumulations near the surface. Since lime and phosphorus move down slowly into the soil, roots that do penetrate do not find sufficient plant food for optimum development.

Florida experiment station workers have built a special subsoil application device which plows the subsoil and deposits fertilizer simultaneously. At stations where rainfall is limited, growth response to subsoiling and to subsoiling together with deep placement (down to 14 inches) of lime and fertilizer is evident. At points where rainfall is adequate, response to subsoiling and deep placement shows no gain, but root penetration has been improved.

And, in Louisiana, the experiment station is recommending deeper placement for cotton in soils where hard pans have developed and been broken (usual practice in the past was to apply fertilizer just below the seed). Experiments are under way there this year on subsoiling and deep application of fertilizers for cotton, corn, and sugar cane.

Placement for Rice, Equipment for Wheat Pace Western Developments

Placement research interest is picking up in the West, although not uniformly so throughout the region. Idaho



Florida experiment station workers have developed this unit for simultaneously plowing the subsoil and applying fertilizer at depths as low as 14 inches

workers, for instance, report doing no work at the present time and indicate they believe fertilizer placement is not likely to have too much influence on Idaho practices in the near future. In addition, relatively little research is under way in Oregon comparing different methods of placement, but one college department head believes placement will be given more attention in Oregon's fertilizer research in the future.

In California, the California Fertilizer Association and others in the fertilizer industry have been devoting a great deal of time and money to finding out how placement can give better results. This year, for instance, University of California workers, using an association grant found that a combination of nitrogen and P_2O_5 drilled to a depth of four inches materially increased rice yields. In the past, fertilizer has been broadcast on rice, and because the phosphorus was near the surface it was not available to the plant root system. (For some time Arkansas recommendations for rice have been preplant application of anhydrous ammonia followed by phosphate drilled in at seeding time. In Louisiana ammonium nitrate and urea applied by planes have been paying well in commercial operation as top dressings for rice.)

Application equipment seems to be keeping pace with new needs generally, although at least two experiment station groups express some dissatisfaction. In North Carolina, side placement has been recommended for years in the region, but many farmers have not been able to procure satisfactory side placement equipment. Therefore, more and more attention is being directed to broadcast methods as contrasted to concentrating fertilizer in rows.

On the opposite side of the country, Washington farmers are interested in nitrogen fertilizer applicators which can be used to apply nitrogen materials in the spring to wheat sown the previous fall and which place the nitrogen four to six inches deep without tearing up too much of the wheat. Such an applicator they feel will enable them to apply nitrogen to make maximum use of the soil moisture. At present, they have two alternatives: estimate winter rainfall and apply the correspondingly estimated proper amount of nitrogen in the fall, or reduce nitrogen application in the fall and then try to give spring surface applications which are considerably less efficient.

Meanwhile, trend to multiple placement equipment appears to be most significant in the Pacific Northwest. Multiple placement—putting part of the fertilizer with the seed and the rest in a band deeper in the soil—will favor use of liquid materials, since their application will require less complicated machinery, workers there believe. Improvements needed in application equipment are: reduced power requirements; less narrower openers (disturbing to seed beds); and more accurate metering of fertilizer.

Too Many Grades?

Could Louisiana farmers use four grades of mixed fertilizers instead of 25?

MANY AN AGRONOMIST thinks we have far more fertilizer grades than can be justified on the basis of soil types and kinds of crops in any given region. Frank E. Boyd, Virginia-Carolina Chemical Corp., for example, says Louisiana farmers could probably do away with 21 grades, and hardly feel the difference. But does the same reasoning apply to other states? According to Mr. Boyd it does, and here are the reasons why.

In the early days fertilizer manufacturers often pulled the grade of their choice out of a hat—without regard to any research findings with soils and crops. The form and grade of fertilizer materials available, type of mixing equipment, economic conditions, and farm practices greatly influenced manufacturing procedures. Manufacturers and users of fertilizers in the early days took

Can Louisiana Farmers Throw 21 Grades Out the Window?

Louisiana Grades	Ratio	Tonnage	Number Grades	Average Grade	Suggested Grade
Equal N-P-K	1–1–1	47,380	4	9–9–9	12–12–12
Varying N but equal P-K	1–3–3	50,306	7	4–12–12	4–12–12
Varying N, Low P-High K	1–2–3	1,140	2	6–8–13	4–8–12
Varying N, High P-Low K	1–3–2	29,660	12	5–14–6	4–12–8