

## Plant Expansion and Confidence in the Future Stand Out in West; Liquids Continue Growth

PLANT EXPANSION keynotes the western fertilizer industry this year with nitrogen and potash leading in planned expansion and phosphates not too far behind. Westerners thus seem confident of the future, despite declining farm income, uncertainties facing major crops under crop support and control programs, and unfavorable weather in at least part of their marketing area.

Potash expansions will not affect fertilizer sales in the West, which uses very little potash as yet, but nitrogen is another matter. After Shell Chemical and Brea Chemicals completed their two ammonia plants in southern California, most people felt that nitrogen-wise the West was fairly well set, at least for a few years, a view that appeared to be borne out by recurring ammonia surpluses during the late summer and fall of 1954. This feeling undoubtedly gained strength as western fertilizer circles watched four new ammonia ventures—two in the Salt Lake City area, one in California, and one in the Pacific Northwest—try (unsuccessfully so far) to reach the pipe-fitting stage. (At press time, the California venture—Ammonia Chemical Corp.—got Merced County approval for its proposed \$3.25 million ammonia plant.)

Some expansion was already under way, however, before new plans began to spring forth last winter. Shell Chemical completed its Ventura, Calif., ammonia plant in late 1953, has since been consolidating its position with a \$2.75 million over-water distribution system from Pittsburg, Calif. to the Pacific Northwest. Dedicated in March, the system will move some 50,000 tons of anhydrous ammonia a year to Pacific Northwest agriculture and industry. Shell feels it has given Northwest farmers the equivalent of a 150-ton-per-day plant in their region—and much sooner than production economics will justify such a plant.

Consolidated Mining & Smelting, meanwhile, completed an ammonia expansion this spring at Calgary, Alta., is now up to 390 tons a day there. In 1955 Cominco will produce about 800,000 tons of fertilizer products, a substantial portion of which will reach the western U. S.

In view of this growth, most Westerners were quite surprised late last year and early this year when two giants jumped into the ammonia picture. First was U. S. Steel with a 200-ton-per-day plant based on coke oven gases at its Geneva, Utah, works. Part of the production will be sold as such, part converted to ammonium nitrate. USS is shooting for mid-1956 completion.

Guessing on outlets for this added production had hardly subsided when Standard Oil of California announced in February a 300-ton-per-day ammonia plant to be in operation at Richmond, Calif., at about the same time. Standard will convert part of its product to 250 tons of nitric acid a day, and California Spray Chemical Corp. (a Standard operating subsidiary) will use both acid and ammonia for making a number of products, including ammonia solutions, sulfate, nitrates, and phosphates. Calspray expects initial production of all products in 1956, full operation in 1957. Excess ammonia and nitric acid will go to industrial markets via Oronite Chemical.

Latest western ammonia entrant is Northwest Nitrochemicals with a plant to be under construction this year in southern Alberta. Associated in the venture are Commercial Solvents; New British Dominion Oil; Ford, Bacon & Davis; and Frank McMahan. CSC will operate the plant on a long-term management contract, will sell ammonia, ammonia solutions, nitrates, and phosphates in the Pacific Northwest and Canada's prairie provinces.

Elsewhere on the basic expansion front, Brea Chemicals will bring in its ammonium nitrate plant at Brea in August. Western Phosphates has undergone continuous expansion at Garfield, Utah, will have its triple superphosphate and ammonium phosphate (11-48) plant up to 110,000 tons per year by now. Stauffer's new Vernon, Calif., plant should be in in a matter of weeks with 500 tons a day of pellitized superphosphate and ammonium phosphate.

## Pacific Northwest Has Best Growth Potential

The West was one of two regions (the other: west north central) in the U. S. to enjoy increased fertilizer sales in the 1953-54 crop year, but in view of current production growth, particularly in nitrogen, something seems likely to give before late 1956. Arizona is coming up fast (irrigated acreage now at 1½ million, with a 157% increase in crop value in the 1945-54 decade), but Utah, New Mexico, and Nevada are not major fertilizer users, and eastern slopes of the Rockies are doubtful outlets pending improvement in the drought situation. And competing with Shell and Brea in their home grounds—California—will not be easy. Therefore, the Pacific Northwest has perhaps the best sales potential for the new production, although it must not be overlooked that it can replace material throughout the West now shipped in from east of the Rockies.

U. S. Steel has an obvious ammonia customer in Western Phosphates at Garfield, Utah, but its closest major market will be the Pacific Northwest. Furthermore, the Pacific Northwest can expect higher imports from Canada now that Cominco has upped its ammonia output, and part of Northwest Nitrochemicals' production will go to the same area.

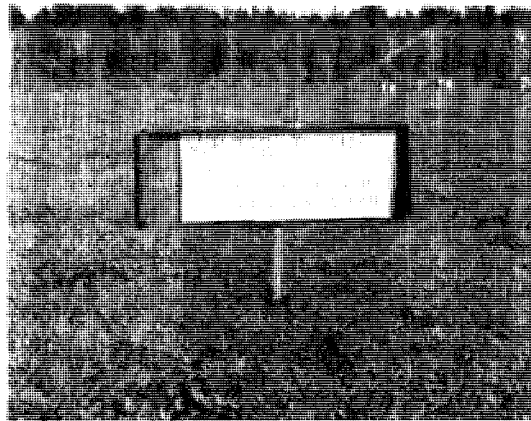
Calspray, with a strong dealer and technical service organization in pesticides (and actually an already substantial business in fertilizers through purchase of Mid-State Chemical Co. in 1953) is probably best prepared to move toward all major fertilizer consuming areas.

## Shell Drops Ammonia Two Cents, Others Follow

With these prospects for nitrogen in 1956, efforts to consolidate sales positions

### New Basic N and P<sub>2</sub>O<sub>5</sub> Capacity—11 Western States and Western Canada

COMPANY AND LOCATION	PRODUCT	CAPACITY	ON STREAM
Consolidated Mining & Smelting Co. Calgary, Alta.	Ammonia	120 t/d (Expansion)	Spring 1955
Pennsylvania Salt Mfg. Co. of Wash. Portland, Ore.	Ammonia	15 t/d (Industrial primarily)	Spring 1955
Sherritt-Gordon Mines, Inc. Fort Saskatchewan, Alta.	Ammonia	75 t/d (Expansion)	Spring 1955
Brea Chemicals, Inc. Brea, Calif.	Ammonium nitrate	50,000 t/y	August 1955
Stauffer, Chemical Vernon, Calif.	Superphosphate. Ammonium phosphate	500 t/y (Total)	June 1955
Western Phosphates Garfield, Utah	Triple superphosphate, Ammonium phosphate	45,000 t/yr. (Expansion)	July 1955
Colorado Fuel & Iron Co. Pueblo, Colo.	Diammonium phosphate	12,000 t/yr.	January 1955
Hughes-Johnson Co. Portland, Ore.	Superphosphate	20,000 t/yr.	Spring 1955
Standard Oil Co. of Calif. California Spray-Chemical Corp. Richmond, Calif.	Ammonia, Ammonia solutions, Nitrates, Phosphates, Sulfate	300 t/d (Ammonia)	1956
United States Steel Corp. Geneva, Utah	Ammonia, Ammonium nitrate	70,000 t/yr. (Ammonia)	1956



Sign keynotes progress on Benedict Farm in Washington, which in recent years has been the scene of a continuing fertilizer demonstration program. Nearly exhausted when the program began, the 100-acre farm was supporting 14 milk cows and 18 head of young stock. Within three years it was supporting more than three cows per acre, including 32 milk cows, on ladino clover and orchard grass, and is now producing enough surplus feed to allow storage for winter feeding

are expected this year, especially in ammonia and in the Pacific Northwest. Shell Chemical moved first in the face of spasmodic price cutting, dropped Pacific Northwest ammonia prices 2 cents a pound at the farmer level upon completion of its over-water distribution system in March. As Shell put it, "We have more than passed on freight savings to farmers." Others have met Shell's price in the area, with midwest ammonia producers (already swallowing a lot of freight cost) feeling the pinch most. Further changes in published price schedules are not expected during this fertilizer year, but how closely sellers will live up to schedules is questionable during what all expect to be a summer of aggressive selling.

Meanwhile, none has followed Shell's fair-trading move (ammonium sulfate) of last fall; most basic producers hope to achieve price stability at consumer levels by publishing recommended prices—or, as one broker put it, "Producers have been suggesting their suggested prices pretty strongly."

Unusual weather this spring has altered fertilizer sales patterns throughout the western area, but the over-all effect is not expected to be serious. Winter rains in California and frozen ground in the Pacific Northwest caused some delay. In the intermountain region, the spring season was about 30 days late. When it did break, about March 15, both basic producers and dealers were somewhat more hard pressed than usual to make requested deliveries. Expectation in the intermountain region is that sales (total plant food units) will be higher this spring than in spring 1954.

Ammonia and ammonium sulfate appear to be in adequate supply, although one basic producer finds sulfate a

bit tight because of the unusually sharp demand peak this spring.

Ammonium nitrate continues to increase in farmer demand because it combines a "quick shot in the arm" with long-range feeding. However, it is tight now, and some expect it to be so for some time to come. Imports are limited by Coast Guard restrictions on unloading at Gulf and Pacific Coast ports.

The chemically combined ammonium phosphates—16-20, 13-39, 11-48, and now 21-53—have an edge on mixes because of a \$10-to-\$15-per-ton price advantage. Of the first three, 16-20 is the most popular in California; the other two are not as well accepted because the area's alkaline calcareous soils react best to nitrogen. California expects products higher in nitrogen and lower in  $P_2O_5$  to become increasingly available and to be well accepted.

Single super continues to lose ground in the West to triple, although one broker notes a 30% first quarter increase in single super sales this year. Single super should continue to find a place in fertilizer programs where gypsum is needed, although some are beginning to question gypsum's value for calcareous soils. Single super also has an edge where concentrated products will not give good coverage at low application rates.

#### Liquids Continue to Grow

Liquid fertilizer use continues to grow, especially in California. However, some—and admittedly those who are still predominately "dry" manufacturers—expect liquid N-P sales to level off in the near future and to grow thereafter at about the same steady rate characteristic of the entire fertilizer industry.

The "wets," needless to say, feel otherwise. More big equipment concerns are showing interest in mass production of liquid injectors. Should this result in inexpensive and standardized equipment, it is expected to be a boon to liquid sales. Liquid fertilizer manufacturers expect in the near future to overcome freeze-out problems on high analysis materials. Meanwhile, they feel inadequate demonstration work is delaying early development of the even larger tonnages liquid products will enjoy once their performance is fully proved.

New liquid facilities continue to come on stream. Monsanto and Brea signed a long term contract last fall for electric furnace phosphoric acid, with the result that Monsanto brought in a new phosphorus burner at Long Beach, Calif., late last year. Brea's two new blending plants at Brea and Fresno, Calif., can turn out liquid N-P products at a 50,000-ton-per-year clip and a third unit is planned for Brawley, Calif. And Agri-form, which pioneered liquid N-P ma-

terials in the West, brought another 20,000-ton-per-year unit on stream at Woodland, Calif., in May.

Newest product to appear this year is diammonium phosphate (21-53-0) (AG AND FOOD, May, page 374) from Colorado Fuel & Iron, which converted its coke oven ammonium sulfate facilities at Pueblo, Colo. Kaiser Steel at Fontana, Calif., made pilot runs for a similar shift in April but is not committed.

Geography aside, where does the West feel its increased output will go? For one place, new land coming under cultivation; primarily the Columbia Basin project and, to a much lesser extent California's Central Valley project are examples. Biggest gains, however, stand to come on lands already under cultivation, such as dry land pasture and grain areas. Pacific Northwest wheat farmers, for instance, may be able to shift from alternating crop and fallow to continuous crop, as they are finding fallow's benefit to be in accumulating available nitrogen and not in storing moisture. Experiments are now under way to peg down whether nitrogen can be substituted for fallow in a wheat-fallow system. In California, a definite statistical gain was found for the first time last season on rice which got nitrogen and  $P_2O_5$  compared to nitrogen alone. More trials are out this season.

Exports will show some gain, too. Brea Chemicals is presently pushing sales in the Mexicali area which has become agriculturally important in the past five years, and Shell is already well established there with anhydrous ammonia. About 450,000 bales of cotton came out of the area last year at about one bale to the acre. When compared to two to three bales an acre in California, a fertilizer potential can be seen, if Mexican farmers can stand the cost.

Long-term data on what becomes of plant nutrients, both natural and those added in fertilizers over a period of years and in relation to crops grown, comes from lysimeters at University of California, Riverside. Lysimeters were first filled with soil in 1926, and summer and winter cropping started in 1934 after soil had weathered eight years

