

Fertilizer Futures Now Traded At CME

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The Chicago Mercantile Exchange (CME) recently added three fertilizer futures contracts to its list of agricultural commodities traded in the futures and options markets. The CME released these contracts for trading on CME's GLOBEX electronic trading platform on June 6, 2004. CME cooperatively worked with private industry to develop fertilizer futures contracts for three of the most frequently used fertilizers: diammonium phosphate (DAP), urea, and urea ammonium nitrate (UAN). DAP is dry and consists of 18 percent nitrogen and 46 percent phosphate; urea is dry and is 46 percent nitrogen; and UAN is liquid and contains 32 percent nitrogen. Annual U.S. sales of these three fertilizers are typically \$5 billion to \$7 billion. The U.S. is second only to China in being the world's largest producer and consumer of fertilizer.

The market price for these fertilizers has been extremely volatile in recent years, with annual price variations of up to 50 percent. This has been caused by volatility in the natural gas market, as natural gas is a significant input in the production of fertilizer. This price variability can expose fertilizer merchandisers and producers to significant risk, and price swings can significantly alter per-acre cost of production. Futures trade in fertilizer provides farmers and agribusinesses a tool to manage the risk associated with purchasing this important agricultural input.

Contract Specifications

The size of the CME fertilizer futures contract is 100 tons, with delivery contract months of March, May, July, September, and December. These months correspond with the application periods for DAP, urea, and UAN and with the delivery months for major grain futures contracts, especially corn and wheat. The futures contracts specify physical delivery upon settlement of the contract. Delivery is based on the current delivery system used in the underlying cash market. Fertilizer production and port of entry occur in the Gulf states, with DAP entry in central Florida and UAN and urea entry in New Orleans. Fertilizer is transported from the Gulf states by rail to the Midwest, where most use occurs. The buyer of the futures contract designates the delivery point and pays for rail transport from the Gulf port. Options are also available for these fertilizer contracts. The strike interval for urea and DAP is \$5/ton, and \$2.50/ton for UAN, and the strike range

is \$50/ton above/below the settlement price. See *Table I* for additional futures and options contract specifications.

Table I. CME fertilizer futures contract specifications.

DAP: Dry, 18% Nitrogen and 46% phosphorus	
Urea: Dry, 46% Nitrogen	
UAN: Liquid, 32% Nitrogen	
Trading Style:	Electronic Only (GLOBEX platform)
Trading Hours (Chicago time):	Monday through Thursday 5:00 p.m. - 3:15 p.m. following day Sundays and holidays 5:30 p.m. - 3:15 p.m. following day Markets close at noon on last trading day
Contract Months:	Mar, May, Jul, Sep, Dec
Contract Unit:	100 tons
Futures:	
Minimum Fluctuation:	\$0.50/ton (\$50/contract)
Maximum Fluctuation:	\$10/ton (\$1,000/contract)
Position Limits:	200 spot month, 1,000 non-spot
Last Trading Day:	Business day prior to 16th calendar day of contract month
First Notice Day:	Business day after last trading day
Last Notice Day:	Last business day of contract month
Options:	
Expiration:	First Friday of contract month
Strike Intervals:	\$5/ton (\$2.50 for UAN)
Strike Range:	\$50/ton above/below settlement price

Separate contracts exist for each fertilizer product, meaning that one can trade in UAN, in urea, or in DAP. There are separate markets for each product, so hedgers can use the futures contract that matches the product they plan to purchase or sell in the cash market. The minimum price movement on the fertilizer contracts is \$0.50/ton, and the maximum daily price movement is \$10/ton. Contract expiration is the business day prior to the 16th day of the contract month, with options expiring on the first Friday of the delivery month. Trading ceases at noon on the expiration day. Unlike other agricultural products like livestock and grain, the fertilizer futures contracts are offered exclusively through GLOBEX, CME's electronic trading platform. Trading occurs Sunday through Thursday beginning at 5:00 p.m. and continuing through 3:15 p.m. the following day. Price quotes are available on the Internet at <http://www.cme.com>.

Risk Management

The fertilizer futures contract offers both farmers and fertilizer dealers/suppliers a way to manage the risk of changes in fertilizer prices. A farmer, for example, might be interested in locking in a favorable purchase price for a time in the future, while a fertilizer supplier may wish to cover cash forward contracts it established with producers by locking in purchase prices using the futures market. In each of these cases, a long hedge would be used. Assume for example that it is December 1 and that the current March futures price of UAN is \$150/ton. The long hedger needs to secure 500 tons of UAN for use (either for application, in the case of the farmer, or to sell to farmers, in the case of the dealer). Because of volatility in the fertilizer and natural gas markets, the hedger decides to lock in the spring purchase at current futures prices by going long (buying) five March UAN futures contracts at \$150/ton. Suppose also that the hedger expects that basis for March (difference between cash and futures price) will be \$10/ton, and therefore anticipates a local cash price of \$160/ton. Suppose that when March arrives, the March UAN futures price is \$175/ton and basis is \$10/ton as anticipated. The hedger would purchase the fertilizer in the spot market at \$185/ton and simultaneously sell the futures contract (alternatively, the hedger could take physical delivery of the fertilizer futures

contract). The futures position gain of \$25/ton would make the realized cash purchase price \$160/ton. This hedge is illustrated in *Table II*. In this scenario, the hedger managed price risk, and would be able to obtain the UAN at a lower price than without the hedge. While this type of hedge is useful for mitigating price risk, it still leaves the user open to basis risk.

Table II. Long hedge example.

<i>Date</i>	<i>Cash</i>	<i>Futures</i>	<i>Basis</i>
12-1	No action	Buy 5 March CME UAN futures @ \$150/ton	Expected 3-1 basis = \$10/ton
3-1	Buy 500 tons UAN @ \$185/ton	Sell 5 March CME UAN futures @ \$175/ton	Actual 3-1 basis = \$10/ton
	Cash price paid = \$185/ton	Net on Futures = \$25/ton	Diff. b/w Act. & Exp. 3-1 basis = \$0/ton

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