

Managing the Soil for Protein

Wheat producers in the Central Great Plains need not forfeit acceptable grain protein levels in order to maintain maximum yields.

Studies by ARS soil scientists Darryl E. Smika, North Platte, Nebr., and Wally Greb, Akron, Colo., indicate that protein levels of 13 percent or higher are possible when yields average 30 to 50 more bushels per acre.

Grain protein levels below the 11.5 percent minimum acceptable for milling bread flour have been reported in western Kansas and western Nebraska, but there have been conflicting reports on the causes. In some studies, protein content declined as yield increased, while higher yield was not accompanied by lower protein in other studies.

Protein is the principal nitrogen-containing constituent in the wheat kernel. Soil and climatic factors affecting the nitrogen nutrition of the wheat plant will therefore produce differences in the protein content of the grain. Dr. Smika and Mr. Greb studied the major soil and climatic influences on grain protein using data from 48 crop years at North Platte, Akron, and southwestern Nebraska locations.

They identified two positive and two negative influences on grain protein levels:

- Protein increased 0.13 percent for each pound of nitrate nitrogen per acre at the 4-to 6-foot depth in the soil at seeding time.

- Protein increased with maximum air temperatures up to 90 degrees F. during the 15th to 20th day before maturity but declined with higher temperature during the 5-day period.

- Protein decreased 0.45 to 0.75 percent for each increase of one inch in available soil water at seeding time.

- Protein decreased 1.5 percent for each 1.0 inch of rainfall received during the 55th to 40th day before grain maturity.

The combined influence of any two of the four factors—soil nitrogen, maximum air tem-

perature, soil water, and rainfall—more accurately predicted protein content than did any one alone, and use of all four gave the closest statistical relationship to protein.

Wheat producers, of course, cannot control rainfall or temperature during the growing season, but they can influence soil water and soil nitrogen available at seeding time by management practices. The combined influence of these factors produced a reasonably accurate prediction of grain protein content at all levels studied.

The scientists found that 11 inches of soil water and 95 pounds of nitrate nitrogen per acre would have been needed to produce

grain with 12 percent protein at the highest yield—58 bushels per acre. They point out that this soil water level can be obtained in most years on the Central Great Plains with good stubble-mulch fallow practices. Nitrogen fertilizer, in amounts balanced according to available soil water, may frequently be needed.

The studies also help explain the conflicting relationships between nitrate levels and yield reported by other investigators. Available nitrogen limited both protein content and yield when grain protein levels were between 9 and 11.5 percent. Protein levels greater than 12 percent were obtained with higher amounts of available nitrogen and smaller amounts of soil

water. Thus, limiting water affected only yield, but limiting nitrogen influenced both yield and protein in the grain.

The researchers say there is no reason why yields higher than the

maximum 58 bushels per acre in the study, along with grain protein of 13 percent or more, cannot be obtained when both soil water and nitrogen are manipulated by management.

WHILE AT THE FARM SHOW

STOP AND SEE THE AMERICAN MADE TIME PROVEN

Automatic Calf Feeder

at the S & S Distributor-Display
Located in the Cattle Barn.

YOUNG BROS.

NURS-ETTE SALES and SERVICE

Ph. 717-548-2462

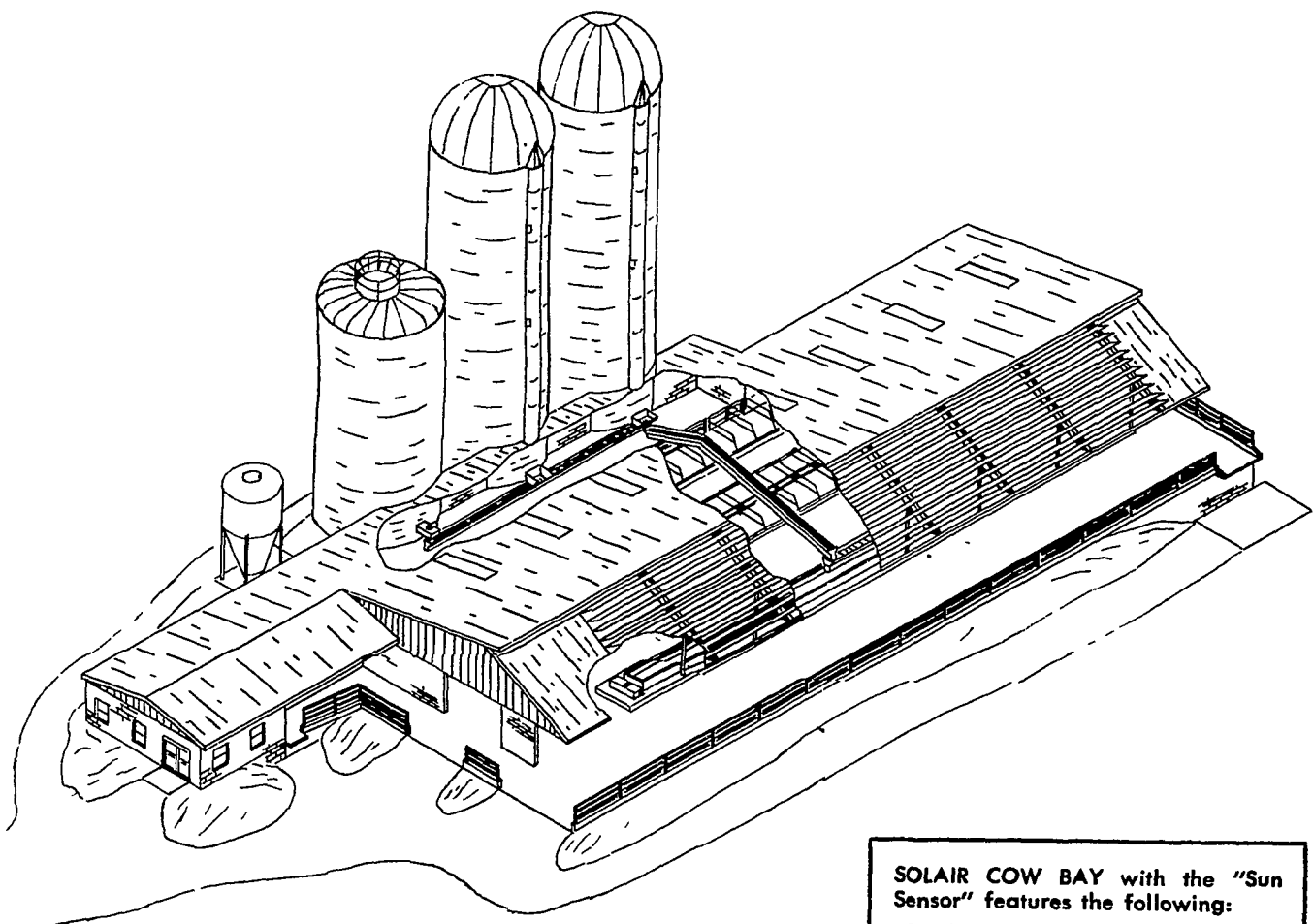
Peach Bottom, R.D. 1, Pa. 17563

Solair Cow Bay

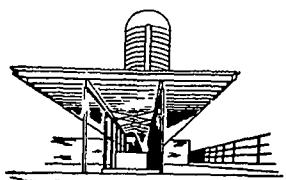
U.S. Patent
#3556055
Other
Patents
Pending

Featuring Solar Thermo Circulation and the exclusive "Sun Sensor" roof

FRANCHISES AVAILABLE



SPACES 332-335 AT THE FARM SHOW



MECHANIZED FEED
LOT SYSTEMS

DISTRIBUTORS FOR:

VAN DALE, INC.

VAUGHAN

FAIRFIELD

PAMLIN

MADISON SILOS

ASK US ABOUT OUR AGRI-LEASING PROGRAM!

SOLAIR COW BAY with the "Sun Sensor" features the following:

1. Storm- and fire-resistant construction.
2. Rapid evaporation and dehumidification through "solar thermo" circulation.
3. Engineered for expansion.
4. Designed for either beef or dairy cattle.
5. Straight line scrape areas.
6. "Quick dry" floor areas.
7. North side ventilation—summer only.
8. Three sided wall structure—open South.
9. "Jalousie type" Southern roof provides direct sun rays on 80% of floor—OPTIONAL.
10. "Sun Sensor" control automatically opens and closes optional jalousie roof for maximum winter comfort.
11. Complete herd grouping accommodations.
12. Automated feed control.

Penna. Broiler Placements Off

Broiler chick placements in Pennsylvania dropped for the second week in a row as the week ending, Dec 23, showed 1,172,000 day-old chicks beginning their feeding cycle, according to a report this week from the Pennsylvania Crop Reporting Service.

This is one percent below both the preceding week and the same week a year ago. The current 10-week average trails the corresponding period in 1971 by eight percent.

Although settings of eggs for broiler-type hatch fell three percent from a week earlier at 1,728,000 this is eight percent better than the same week last year and the three-week average tops a similar period last year by seven percent.

The heavy shipment of day-old chicks to points outside the state earlier this year has been slowly tapering off. These shipments now average under 200,000, ten percent less than in 1971.

Help Keep Pipelines From Freezing

Repairing doors to the pump house and replacing broken window panes helps keep the water pump from freezing on cold nights. A socket for a heat lamp just over the pump is helpful on extremely cold nights when the temperature drops very quickly, says N. Henry Wooding, Extension agricultural engineer at The Pennsylvania State University.

CALEB M. WENGER

Drumore Center R. D. 1, Quarryville, Pa.
Phone 548-2116