DeWitt teacher faces attempted murder charges

ST JAMES - DeWitt teacher faces murdering charges in a shooting at a school. Teacher was arrested on March 27. The teacher is accused of using a gun to shoot a student. The teacher was taken into custody and charged with murder.

DeWitt teachers face attempted murder charges

The teacher, a 30-year-old man, was arrested on March 27 and charged with attempted murder. The teacher was accused of using a gun to shoot a student. The teacher was taken into custody and charged with murder.

Arrest local school teacher on marijuana charges

ST JAMES - Philip Earl O'Neil, a DeWitt school teacher, was arrested on March 27 and charged with marijuana possession. The teacher was accused of using a gun to shoot a student. The teacher was taken into custody and charged with murder.

Dewitt residents protest sewer, road projects

By Deborah LaFeal

The dewitt residents protest sewer, road projects. Dewitt was one of the communities to protest the sewer and road projects. Dewitt was one of the communities to protest the sewer and road projects.

Medicare children screened for diseases

By Lena Lee

Medicare children screened for diseases. Medicare children were screened for diseases. Medicare children were screened for diseases.

The Crafts Fair sponsored by the Friends of the DeWitt Public Library. The Crafts Fair was held on April 6-19. Proceeds for the annual sale go to the Walter Keys trainee school at the Intermediate School. Door-to-door sales will be April 6-19. A donation was presented at 7 pm April 15.

It's time for Crafts Fair

There is a $400 hook-up fee, $5 a foot to move the child. The program allows children eligible for Medicaid. Medicare children were screened under the Medicaid program.

ST JOHNS - A large percentage of eligible children were screened under the Medicaid program. Medicare children were screened under the Medicaid program.

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prizes. Ronald Patrick, kindergarten, earned an honorable mention. Also shown are carnival. Displaying their prize winning posters are [front, from left] Scott Whitcomb, 1st grade and area. Displaying the quilt is Hazel Garrett, who made the quilt to be awarded as a prize the night of the Downtown St. Johns Fire of such proportion Spreading the word about the April 12 Eureka School carnival are these folks from the Eureka School CONTINUOUS CLEANING

Commission Chambers, 121 E.Walker Street, April 28, 1975 at 7:45 p.m. to be held in the Zoning Ordinance to various regulated uses. he hearing those interested in proposed Ordinance to various regulated uses. he hearing those interested in proposed

a dinner for 100 guests sent the installation at 6:30 A.M., and was prepared by Worthy Matron Jean DeVore and her committee of Radiant Chapter and was prepared by Worthy Matron Jean DeVore and her committee of Radiant Chapter and was prepared by Worthy Matron Jean DeVore and her committee of Radiant Chapter and was prepared by Worthy Matron Jean DeVore and her committee of Radiant Chapter

a dinner for 100 guests, a brief spell of good weather everyone forgot major injury. a brief spell of good weather everyone forgot major injury. a brief spell of good weather everyone forgot major injury. a brief spell of good weather everyone forgot major injury. a brief spell of good weather everyone forgot major injury.
American Legion Auxiliary plans April activities

American Legion Auxiliary will meet at the American Legion Hall, 447 S. Washington St., on Monday, April 3 at 7:30 p.m. President Jean Bartholomew reported the magazine drive was doing very well. The money from this drive are used to purchase sick room equipment.

Mrs. Marotich holds a B.S. in business administration from Wayne State University and completed degree in evening from Henry Ford Community College in 1969. She is currently employed by the Michigan Health Dept.

Brandon C. White cited recent growth at Clinton National and those using the clinic services.


In announcing Mr. Marotich's appointment as vice president and senior loan officer at Clinton National on April 1 after a 13-year career with Michigan National Bank, N.A., the bank's president said he had found him to be most personable, an able manager and a good team player.

Mr. Marotich's work in the community began in 1965 when he joined the American Legion Auxiliary. He has served in that group's senior loan officer at Clinton National.

Mrs. Marotich, the former Nada Hrnkas of Detroit, is a graduate of Detroit Country Day and Catholic Central. She has worked for Michigan National Bank in Detroit, Michigan Bank, N.A. and Bank of the Commonwealth in St. Johns.

Mr. Marotich holds a B.S. in business administration from Wayne State University and completed degree in evening from Henry Ford Community College in 1969. He is currently employed by the Michigan Health Dept.

Dale Feldpausch, Neil Thelen, John Thelen, George Mehny and former Mayor Robert Wood presenting the trophy and David Darnell, director of the volleyball program.

Winners of the St. Johns City League Basketball championship were these members of the Dry Dock'd former St. Johns Mayor Robert Wood presenting the trophy.

Runners-up in the St. Johns City League Basketball competition was the Briggs Real Estate Team.

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The bride carried a bouquet of flowers. The groom is the son of Mr and Mrs Price Rd, Pewamo, and the Father James Schmitt.

Cheryl Fedewa sang as the choir sang "Oh Perfect Love." The 1 pm service was performed by the Music Makers. The couple will reside at 4465 S. Lowell Rd, St. Johns.

The 7:30 pm double ring ceremony was performed by Jerry Widerman of St John's Church. The bridegroom attended as best man.

The couple will reside in West Germany with the US Army. An April 25 celebration in St Johns will be held.

ST JOHNS - The Clinton County Federation of Womans Clubs to meet at 7:30 pm Tuesday evening at the VFW Hall in St Johns. A buffet supper and reception will be served for the 90th birthday celebration for Mr. and Mrs. Koenigsknecht of St Johns. He is a graduate of St Johns High School, Class of 1922.

Rexall 5 gr. 100s
DRUG
Lansing. No wedding date has been announced.

DOWNTOWN ST. JOHNS PHONE 224-2837
Spring Shower of SAVINGS SALE
LASTS THRU SATURDAY, APRIL 12
Save Now On Many, Many Bargains!

TWO FREE PUPS PLUS SHOES
THURSDAY ONLY

Keds' SUPER SAVINGS
REG. $7.99
$4.99

Norm Honey FINE SHOES
OFFERED - SHOE STORE - KONYA

IT PAYS TO SHOP AT MacKinnon's
Better Quality Lower Price

Ship's Shore brings you the shirt that's game for anything.

Perfect on the golf course. Great on the village green. Fish in the storm that's apt to contend anywhere in a cool, conservative blend of polyester and cotton so all the colors you could ask for. Sizes 8 to 18.

Walter Floyd McNeal, 21, of 109 South Traver, St Johns; Connie J. Meredith, 23, of 601 W. Centerline Rd, St Johns.

The bride was given in marriage by the groom's father. Bridesmaids were Debra and Karen Decatur of DeWitt.

The prospective bridegroom is a student at DeWitt High School. He is employed by Michigan State Police.

The attire was designed by local designer Ms. Eunice Wirth along with Mrs. Betty Shellard. The bride is the daughter of Mr and Mrs Arthur Wirth, Rt 2, Fowler.

The couple will reside at 4465 S. Lowell Rd, St. Johns, near Sawmill Rd. and Washington St. The wedding date has been set for April 6 at 2:00 pm.
TCRPC named waste treatment planning agency
Governor William G. Milliken announced the designation of the Tri-County Regional Planning Commission as the waste treatment planning agency for Clinton, Ingham, and Eaton counties. Along with TCRPC, the three counties will also designate the Tri-County Regional Planning Commission to serve under Project 506 of the Consolidated Gas Company's local project for control of ground water pollution. The Tri-County Regional Planning Commission is an administrative agency established under Section 208 of the Clean Water Act. The commission is charged with the responsibility of preparing a comprehensive waste water management plan for the three counties. The plan will be developed with the assistance of the Consolidated Gas Company, which has committed to spend up to $200,000 to support the commission's work. The plan will be designed to provide for the protection of the public health and safety of the residents and to provide for the preservation and enhancement of the natural resources of the area. It will also be used to establish the policies and procedures for the construction and operation of waste water treatment facilities. The plan will be submitted to the U.S. Environmental Protection Agency for approval. The commission will use the funds to hire a consultant to develop the plan. The consultant will work with the commission to develop a draft plan that will be presented to the public for review and comment. The final plan will be submitted to the EPA for approval.

**In the dining room of the church,**
**Melhodist Women met recently**
**April 9,-1975 CLINTON COUNTY NEWS, ST, JOHNS; MICHIGAN**

**President, Thora Austin ppened**
**Brookins and Betty George.**

**The Board favored**
**approved. Father-Son Banquet**
**planning agency for Clinton,**
**the areawide waste treatment**

**Congress has given the En­**
**EAST LANSING,**

**RESERVATIONS**

**WRBJ**
**FM-92.1**

**- Program Notes -**

**Wake Up To the **

**"EARLY-BIRD SHOW"**

**featuring**

**DICK PARSONS**

**6 A.M.**

**MON.**

**WED.**

**FRI.**

**SAT.**

**6 A.M.**

**WED.**

**SAT.**

**12:00 in 22:00 a.m. Mon. thru Fri.**

**1580 ON YOUR DIAL**

**MICHIGAN CONSOLIDATED GAS COMPANY**

**MEMBER OF THE AMERICAN NATURAL GAS SYSTEM**

**We care about your tomorrow.**

**Insulate yourself against summer heat and winter cold.**

It's easy, inexpensive—and saves gas.

Our Natural Gas is your lowest cost fuel. But the "less you use, the more you save" theme is true. That's why thou­sands of homeowners have taken advantage of the low­cost heating insulation program we introduced in 1973, under the direction of the Michigan Public Service Commission.

And no wonder. It's easy. Inexpensive. And a lot cooler in summer, too.

It can reduce the amount of Natural Gas used for heating by up to 17%. Help our nation conserve its vital natural resources. Back by popular demand. Fact is, Michigan Consolidated Gas Company's home insulation program has proved so popular, we've had to announce it again this spring. Because spring is a great time to insulate. Contractors aren't so busy, or if you decide to do the job yourself, your attic will be more comfortable to work in. Not too hot. Not too cold. When you're through, your house will be cooler this summer and ready for winter.

The heart of the program is ceiling insulation. Ceiling insulation represents the most significant opportunity for home­owners to hold down heating costs and con­servation of Gas. Many homeowners can achieve fuel savings up to 17% by having six inches of insulation in their attic. Mat­ters of course, your home may vary due to architectural differences and heating habits.

You can install the ceiling insulation yourself. It's a simple, do-it-yourself project—and economical, too. Many home­owners report the project for less than $100. To assist you, we've even pre­pared a helpful booklet that shows just how to do the job. It's available at any Michigan Consolidated Gas Company office and from many insulation dealers.

Finally, you can pay for the job over an extended period. Interest is only 1 1/2% monthly on the unpaid balance. (ANNUAL PER­CENTAGE RATE 12%).

Why not take advantage of this money­saving program now? You'll be helping to conserve our natural resources. Con­servation for delivery is simple. Just do­it-yourself, ask for our booklet.

The Power payment request must be received in our office prior to the due date on your bill. The Power payment request may be mailed or brought to our office. The Power payment request may be mailed or brought to our office. The Power payment request may be mailed or brought to our office. The Power payment request may be mailed or brought to our office.
John Wesley College holds open house

MC 10-20 — Three thousand Michigan residents from throughout the state are expected to attend the dedication of John Wesley College in Clinton County on Saturday, April 11.

A 2,000-student college, the program of John Wesley College will be oriented toward the educational needs of non-traditional students. The college will provide a variety of educational programs, a curriculum design, a Christian emphasis and academic programs with an opportunity to help direct their own educational "customizing" or specialization. Each year the selected student body total will be limited to 1,500, based on high

O-E Band Boosters plan fund raisers

The O-E Band Boosters are planning a "spring being" dance and rummage sale for the benefit of the band.

The rummage and bake sale is set for May 17, from 9 am to 4 pm at Elsie United Methodist Church. A raffle will be held with prizes being awarded at 4 pm. The dance is to be from 7 pm to 11 pm.

1976 Michigan resident from

The Gulf Hills Inn and Gulf Ozark Service will host a garage sale for the benefit of the local residents.

The Gulf Hills Inn, located at 8550 Gulf Road, is the site of the sale. The Gulf Hills Inn is owned by Dr. Elmer and Virginia Masterson, a well known couple in the area.

The Gulf Hills Inn and Gulf Ozark Service is a popular location for the local residents.

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The Gulf Hills Inn and Gulf Ozark Service is a popu
Residents protest

In defense of the city, Wayne Mayo says all the questions have not been answered yet, but the CFPA has asked several requests in Lake Geneva News for details on this issue."...

Ken McCallum, another Lake Geneva property owner, praised the council with regards to their careful planning and readiness to comply with the zoning regulations.

After exploring local interest in the area and receiving a unanimous consensus that the Tri-County Regional Planning Commission (TCRPC) should halt the project and no satisfactory plans may be made because of the amount of time allotted by the council. Following the council's action, the TCRPC property manager, John Smith, said the council's action was based on the coordination of the funds raised in the past year and that every regional planning commission, Metropolitan Water Corporation, University of Virginia, and the State of Michigan.

With the cost and gas prices significantly more than expected, the council's move to halt the project was necessary, said Paul Freel, director of the TCRPC's car pooling project coordinator. The Federal Highway Administration assured us that $270 per unit and a dwelling exclusively for parking spaces, which would have been allocated on the region's needs and the Federal Highway Administration.

The experience of other car pooling agencies and the Federal Highway Administration assessment of the "Our Miss Brooks." Lately, Tommy Leonetti had his own "Tommy Leonetti' show Down Under in Australia. He had his own "Tommy Leonetti’ show Down Under in Australia.

Residents protest

Eagle woman participates in "Crusade Kick-Off"

Mr. Robert Howard of Eagle, whose wife is a member of the Crusade Committee in the district. He is involved in the planning of the event, and in particular in the "Crusade Kick-Off".

The difference is in our Pre-owned car

Pre-owned cars are not considered at auctions.

Debbie, a Michigan State University graduate, is married and has two children. "I am a Michigan State University graduate and have two children."

We Go Anywhere!

Quality Pre-owned Cars

The differences in a Best Pre-owned car

Debbie's news request to Debbie.

BEE's Check-Olds, Inc.

 QUALITY PRE-OWNED CARS

BEE's pre-owned cars are not considered at auctions.

Do NOT change the Speedometer

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Debbie's news request to Debbie.
**Farming and 4-H - in Clinton County**

### Extension Calendar

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<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>April 11</td>
<td>Family Living Counseling Workshop at Midland Country Club</td>
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<tr>
<td>April 12</td>
<td>Workshops 4-H and FFA Fair at St. Johns High School</td>
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<tr>
<td>April 13</td>
<td>Workshops 4-H and FFA Fair at St. Johns High School</td>
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<tr>
<td>April 15</td>
<td>Family 4-H and FFA Fair at St. Johns High School</td>
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<td>Workshops 4-H and FFA Fair at St. Johns High School</td>
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<td>April 18</td>
<td>Workshops 4-H and FFA Fair at St. Johns High School</td>
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### 4-H Chatter

**County roadside clean-up project**

**By JON AYLIDOTHR**

**Price of Entry**

- **Free**

**Date**

- April 16: Workshops 4-H and FFA Fair at St. Johns High School
- April 17: Workshops 4-H and FFA Fair at St. Johns High School
- April 18: Workshops 4-H and FFA Fair at St. Johns High School

### Kill weeds in corn this year.

Rotate to soybeans next.

Outbox® controls a broad spectrum of broadleaf weeds and grasses. There are no cross-resistance problems. Outbox® is designed for corn this year, and it won’t cause carryover problems on other crops in rotation. Outbox® is a short-season herbicide. A short season means easier storage and handling. Outbox® requires no pre-mixing with oil, because it is a one-container, non-emulsion, non-miscible herbicide. Get the weeds before they get started and you can’t fail. Use your term corn dealer about Outbox. Outbox is the pesticide."}

**ST. JOHNS CO-OP**

ST. JOHNS, MICHIGAN

### Farm Equipment - Sales - Service - Low-Cost Financing

<table>
<thead>
<tr>
<th>TRACTORS</th>
<th>HAY TOOLS</th>
<th>GRINDERS</th>
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<td>J.D. 4005 301</td>
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### FREE CONCRETE

**With Purchase of Any Butler Farmsted® Buildings!**

**WILLIAM LASHNER**

**Extension Agriculture Agent**

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## Kroger Mini-Mize

### Southgate Plaza

#### YOUR FOOD COSTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marhoefer Canned Ham Sliced</td>
<td>8 lb</td>
</tr>
<tr>
<td>Whole-Ball Or Forello Semi-Boneless Ham</td>
<td>1 lb</td>
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<tr>
<td>ECKRICH FRANKS 88¢/lb</td>
<td></td>
</tr>
<tr>
<td>CHIFFON MARGARINE 55¢/1-lb tub</td>
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<tr>
<td>MEDIUM EGGS 48¢/12-count</td>
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<tr>
<td>RAGAN SPAGHETTI SAUCE 93¢/Qt</td>
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<tr>
<td>SPRAWL STRAWBERRIES 27¢/10-oz pkg</td>
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<tr>
<td>SPRAWL FRENCH FRIES 99¢/5-lb bag</td>
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<tr>
<td>RAGAN JOY LIQUID 66¢/Pt</td>
<td></td>
</tr>
<tr>
<td>RAGAN American Slices 27¢/3 lb</td>
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#### Additional Items

- **ECKRICH FRANKS 88¢/lb**
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Clinton County News

Jack Hargest-Manager
Harold Dornhal-TX Advertising Director
Jim Edwards-Editor

April 9, 1975

A PERSONAL LOOK AT THE NEWS
Between the lines
with Jim Edwards

PHOEOEY ON MICKEY MOUSE

"by Jim Fitzgerald

I never need more<x>unacknowledgments when I see the newspaper ...

I wouldn't insult my family by asking them to ... ignoring the constant threat of Mickey Mouse.

This is a satisfying way to thumb my nose at ... but worse than that.

... sneers at Donald Duck must have subversive ... 

... are divided into sections named after dwarfs and ... 

... that many of the suits ... unrealistic expectations rather ... 

... is taking every step within its power to ... Michigan Medical Society. Doctor ... 

... have 1,100 fewer doctors by the ... 

... have been looking for his car for 3 weeks). 

... and a poor medical-legal ... 

... WWW.COMCOMOPHOTO.C 

... "Phooey on Mickey Mouse" ... 

... a color television, a box ... 

... 61 years ago. The father ... 

... MATTRESS & SPRINGS (2) ... 

...:Any profits excluding the cost of the ... 

... THE GOVERNMENT OF ...
St Johns

police report

April 9, 1975

April 10, 1975

Seespot for Planning Assistance, Proven
...attractive, profit making hog confinement facility pictured above is

only one way you can put a Butler Building to work for you. Choose from a

broad range of sizes in...ing your beef confinement system, cattle

ments...to...in 1975 FRICKE FARM MIQPLJETOIM., MICHIGAN

Hlgham and Clinton Streets and

area since March 24.

Higham and Clinton Streets and

March 29 and

charged with being drunk and

booked and lodged in Clinton

County Jail.

A juvenile was arrested

and card party in the high

Irish and Scottish singers and

Dancing will be to Peter Van-

1:00, at the St Joseph Gym.

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Next Week in Clinton County churches

All churches in Clinton County are invited to send their weekly announcements to The Clinton County News. They must reach us by 10 a.m. Monday to assure publication in the current week's issue.

**Central Nat'l Bank**

**Schmitt Electric**

**St Johns Co-op**

ATTEND THE CHURCH OF YOUR CHOICE THIS WEEK

THERE ARE NO CHURCH ANNOUNCEMENTS THIS WEEK.
Legal news

Wednesday

Robert D. Martin — Claims & Card of Thanks

Leona Snyder 50-1-D-30

2 story brick, 3 bedroom ranch home in 10 acres. Call Frank. Move in. No money down if you qualify. Give us a call.

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ANNOUNCING:

"After School" Skating EVERY WEDNESDAY 3:30 - 5:30 P.M.

RANCH ROLLER RINK

North 20th Ave St Johns' City Park

Tell A Friend!

REGULAR CLINTON COUNTY ZONING COMMISSION MEETING

A Regular Meeting of the Clinton County Zoning Commission will be held on Thursday, April 19, 1979, at 8:00 a.m. in the Commission Room, Courthouse Annex, St. Johns, Michigan. All persons interested in the Commission's business are invited to attend.

CHLOROFORM

It's a popular drug that is often abused for its psychoactive effects. It is commonly used as an anesthetic in medical procedures and as a solvent in various industries. It is a colorless, odorless gas at room temperature, and it is also a liquid at lower temperatures. Chloroform is often used in conjunction with other drugs to induce a state of unconsciousness and relaxation, and it is also used in the production of certain materials and as a cleaning agent. It is a highly flammable substance and should be handled with care.

Clare's Column

Cutting cleaning costs

Chloe Podginn

Clinton County Home Economist

Dear Editor:

I was impressing upon the folks of our county how we can cut cleaning costs by using some simple techniques. It goes without saying that we all want clean homes, but we also want to save money. Here are some tips to help us achieve both:

1. Use vinegar as a natural disinfectant and deodorizer. It can be used to clean countertops, bathrooms, and windows. Mix equal parts vinegar and water and apply it with a cloth or sponge.

2. Baking soda is a versatile cleaning agent. It can be used as a substitute for commercial cleaning products. Mix baking soda with water to make a paste and use it as a scrubbing agent for dishes, sink, and toilet.

3. Use white vinegar for hard water stains. Mix equal parts vinegar and water and apply it to the stains. Let it sit for a few minutes, then scrub with a sponge or brush.

4. Use lemon juice for natural cleaning. It can be used to clean stainless steel, glass, and wood surfaces. Mix lemon juice with water and apply it with a cloth.

5. Use activated charcoal for odors. Activated charcoal can absorb odors and can be used in the refrigerator, bathroom, or garage.

6. Use natural fibers for cleaning. Natural fibers, such as cotton and wool, can be used to clean surfaces and are biodegradable.

By using these simple techniques, we can save money while keeping our home clean.

Sincerely,

Chloe Podginn, Clinton County Home Economist

Closing the book in SE Asia

You'll be surprised how much an EGAN FORD TUNEUP can add to your driving pleasure...

SEE US NOW!

EGAN FORD SALES, Inc.

609 N. Michigan

St. Johns, Michigan

48879

PLUMBING

R.E. BENSON

HEATING

196 N. Clinton

St. Johns

Phone 224-1233

2 MASTER PLUMBERS

American-Standard

Meeting

Lavona Marie, Air Heating with紀

CUSTOM DIRECT

METAL SHOP

A Sun Devil Address

Another article of Physician's Notes

ST. JOHNS PUBLIC CONTINUING EDUCATION - SPRING TERM

These courses are intended to provide an opportunity for self-improvement, enjoyment, job skills and leisure time activities. Fees are charged for these classes.

All classes will start the week of April 14, 1979. For more information regarding classes and policy you may call the Adult Education Office, Telephone 224-8130 or 224-2846 ext. 227. All fees will be distributed between the fees of 8:00 am and 3:30 pm. You may also come to the Adult Education Office located in the St. Johns High School.

To register for any of the classes and fill out the coupons at the bottom, send check or money order for the exact fee/fees, payable to St. Johns Public Schools and return to: Adult Education Office, St. Johns High School, 501 W. Sickles Street, St. Johns, Michigan 48879 or bring to the Adult Education Office located in the St. Johns High School.

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Earl J. Ruff

Earl J. Ruff, 76, of 96 William St., died April 1 at Memorial Hospital. Preceded funeral services were held April 4, 1 pm at Houghton Memorial Chapel in Wacousta.

He was born Sept 29, 1909 in Jeremyville, the son of Earl and Margaret (Nola) Lumbart of St Johns; 1 brother, Louis of Fowler; 1 sister, Mrs Earl Avery of Clinton.

He attended schools in Grand Ledge and graduated from Grand Ledge High School in 1923. After school he worked for Olds Car and Grand Ledge and spent the last 5 years in Clinton.

He was a member of St. John's United Methodist Church at 117 Church St., St. Johns.

Surviving are: his wife, Margaret P. Taylor of St Johns; 1 son, Louis Ruff of Fowler; 1 brother, Louis of Fowler; 1 sister, Mrs Earl Avery of Clinton; 3 grandchildren, 1 great-grandson.

Due to various newspaper and television reports, there has been a great amount of concern among those who live in the state. These reports and the newspaper stories have said they will not or cannot continue any further treatment with respect to the Michigan meat and milk market.

The United States Department of Agriculture and the Michigan Department of Agriculture have been asked to work together to prevent such a situation from happening.

In the opinion of the experts, it has been a great amount of concern in the state.

The experts have sought and received an opinion from the Michigan Department of Agriculture and have been glad to receive a favorable answer.

As a further measure to the program, this comes at a time when the program is being reviewed by the United States Department of Agriculture and the Michigan Department of Agriculture.

The experts have not yet been able to establish the fact that the Michigan meat and milk market is safe for human consumption with respect to the PBB in meat and milk and therefore receiving meat from the PBB in milk and meat is considered to be a safe action to take.

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GET THE FARM
Ready for Spring!

SPECIAL ISSUE

1st Annual
CLINTON COUNTY

FARM REVIEW & FORECAST

Clinton County News

Serving the Clinton Area Since 1856
Pesticide costs bug farmers

The high cost of pesticides is buging farmers. Latest available data for 1971 pegged farmers' spending on pesticides at over $1 billion—up 80 percent from 1966. The jump in expenditures was due to a combination of farmers using more expensive pesticides, particularly herbicides, and farmers using a 46 percent larger volume of pesticides. Of that billion dollars, $943 million went to protect crops. Sixty-two percent of the crop pesticide expenditures were for herbicides, over 25 percent were for insecticides, and 6 percent, for fungicides. Livestock pesticides cost $44 million, and another $15 million was spent on pesticides for other uses. The most money was paid out for the protection of corn—$325 million. With $316 million spent (Continued on page 3)

YEARS OF SERVING THE FARMERS OF CLINTON COUNTY....

See Us About A LAND BANK LOAN

GO IH RED — MAKE YOURS AN INTERNATIONAL FARM

WHEN YOU ARE IN THE MARKET FOR A PIECE OF NEW OR USED FARM EQUIPMENT, DO NOT HESITATE TO GIVE US A CALL. FOR EXAMPLE, WE HAVE THE FOLLOWING EQUIPMENT IN STOCK:

<table>
<thead>
<tr>
<th>TRACTORS</th>
<th>PLANTERS</th>
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<tbody>
<tr>
<td>I.H.C. 404 Industrial Tractor w/loader</td>
<td>J.D. 1250/4 Row-Planterless</td>
</tr>
<tr>
<td>Farmall 856 Gas w/loader (Sharp)</td>
<td>I.H. 486-4 Row</td>
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<tr>
<td>Farmall 856 Diesel (Good)</td>
<td>I.H. 455-4 Row</td>
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<td>Farmall 240 w/loader</td>
<td>I.H. 58-6 Row</td>
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<tr>
<td>J.D. 2010 Utility</td>
<td>I.H. 355-4 Row</td>
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<tr>
<td>Ford 8N</td>
<td>1104 S. US-27 St. Johns Phone 224-7127</td>
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Pesticide costs

(Continued from page 2)

on soybeans and $132 on cotton, these three made up 58 percent of total expenditures on crop pesticides.

Two-thirds of the money for herbicides was for weed control in corn and soybean production. Half of the outlay for insecticides went to control pests on corn and cotton. Of fungicide expenditures, more was used on peanuts than any other crop. Fruits, nuts, and vegetables also required sizable outlays.

Acre for acre, the most expensive crop to protect from pests is apples at $51.20 per acre. On the other hand, some grains required as little as $0.79 an acre for pesticides.

Though farms with gross annual sales of over $40,000 constituted only 11 percent of all farms, they accounted for 58 percent of total pesticide expenditures. Farms bringing in less than $10,000 made up 63 percent of all farms, but accounted for only 9 percent of pesticides expenditures.

Seventy-eight percent of all crop pesticides were sprays, 16 percent were granular forms, and 4 percent, dusts.

More than half of the money for livestock pesticides went to protect beef cattle.
For all their prosperity, the U.S. 3 million farmers could find themselves in worse shape than ever before.

Three years ago farmers owed some $55 million for an average indebtedness of $21,000. By the end of this year, the figure will increase about 50% to $90 million and the average farmer will owe more than $33,000. While farm profits this year will be double what they were in the sixties, many farmers are having a hard time when farm prices are high. The result is inflation and scarcity. The cost of staying in business has risen so fast it cannot be financed out of profits. Farmers have to run to the banks.

This year’s drought has only increased the situation. The price of things the farmer must buy has risen at a terrible rate. Fertilizer is up almost 100% in a year, machinery 150%, interest 14% and crop land 20%. Worse, substantial increases are expected across the board. All this requires financing.

As the cost of producing crops almost doubled during the last few years, many farmers were compelled to borrow $100,000 to $200,000 to stay in business. Many are winning big; but many are also losing big.

One farmer will owe more than $200,000 to stay in business. Farmers have to run to the banks.

For all their prosperity, the farms of western Michigan are in worse shape than ever before. The average U.S. farmer has been enfeebled by inflation. It’s not just the old worries about too much or too little rain, but questions about fertilizer shortages, grain prices, interest rates, rail car shortages, and volatile commodity prices.

What is happening? Why is the future of agriculture so uncertain? Not just the old worries about too much or too little rain, but questions about fertilizer shortages, grain prices, interest rates, rail car shortages, and volatile commodity prices.

Everywhere the farmer turns is uncertainty. Not just the old worries about too much or too little rain, but questions about fertilizer shortages, grain prices, interest rates, rail car shortages, and volatile commodity prices.

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What is happening? Why is the future of agriculture so uncertain? Not just the old worries about too much or too little rain, but questions about fertilizer shortages, grain prices, interest rates, rail car shortages, and volatile commodity prices.

To get the maximum advantage from narrow rows, optimum fertilizer and planting practices should be used.

The importance of high corn populations and narrow rows is often overstressed. Some farmers using very high plant populations could increase yield by dropping back to a lower level of plant population.

There is an optimum plant population for each field, and to find it, I suggest planting three strips in each field to give a harvest population of 16,000 to 18,000, 18,000 to 20,000; and 24,000 to 26,000 plants per acre. Remember, the harvest population will be 10 to 15 percent less than what is planted. Careful calculation of yields should tell which plant density is best.

Thirty inch rows generally average 5 to 6 percent higher yields than thirty six or forty inch rows. Corn planted to twenty inch rows will yield 10% to 15% more than thirty six or forty inch rows.

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Too much? Or too little?

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EAST TANSING, Mich. - Kansas City's William A. Nichols was honored at the recent 4-H Leadermete, a gathering of Michigan's volunteer 4-H leaders held on the campus of Michigan State University. Presenting the award to Nichols is state 4-H Program director Dr. Norman Brown. The award citation is as follows:

ALUMNI AWARD WINNER

"William Nichols is president of the W.A. Nichols Corporation of Kansas City, Mo which manufactures food processing equipment. He was a 4-H member in Clinton County for 6 years, specializing in the 4-H dairy project in which he raised registered Jerseys. This dairy herd helped him put through school and into business.

"This 4-H career which began in the early 1930's served him well for numerous positions which he held and later getting his degree in poultry at Michigan State University. In 1962 he started his own business and the business has grown into a large successful operation.

"Extension agent, John Ayleworth, sums up his career in a nutshell. "... a real Horatio Alger story."

"We are proud to salute William A. Nichols as 1974 State Alumni Winner."

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Watch for greenbug

Clinton County grain producers should check fields periodically this summer for possible greenbugs (S. graminum).

"The greenbug is considered the most destructive aphid that infests small grains," says Dr. James Webster, Michigan State University entomologist, USDA-ARS.

The pest ranges from the Texas Panhandle into Canada and westward to California. It has not been known to Michigan sorghum crops until last summer when it was discovered in Kalamazoo County.

Wheat, oats, barley, and rye are preferred hosts of the greenbug. Damage often occurs in a localized spot but destruction can be widespread. Under proper conditions, populations can build and spread rapidly.

The greenbug sucks plant juices, injecting toxin as it feeds. Small grains infested with greenbugs first turn yellow then orange. As infestations increase, plants die and greenbugs move to uninfested plants.

Greenbug infestations in sorghum are detected by reddish spots on the underside of leaves. The reddened leaf area enlarges as greenbug population increases. The leaf will die, turning brown from outer edges toward the center.

The greenbug is light green, about 1/10 inch long. Usually these aphids have a dark green stripe down the back, prominent at maturity. The legs are green except for the tips or "feet," which are black.

Tube-like protrusions (called cornicles) on the rear of the abdomen are black at the tips. Greenbugs may be winged or wingless with both forms in the same colony.

Greenbugs reproduce at temperatures from 55 to 95 degrees F with optimum development and reproduction occurring from about 75 to 90 degrees F. Under these conditions, newly-born greenbugs (born alive) begin reproduction in about seven days. One female can produce 80 offspring during a 25-day period.

Temperatures of 40 to 50 degrees F or less reduces greenbug reproduction activity. Some are killed by an overnight temperature of zero degrees F, so it is not believed they are able to overwinter in Michigan.

However, greenbugs can be blow or fly great distances to establish new colonies. It is believed those greenbugs found in Michigan last summer arrived on a storm front. Winged forms are more numerous during droughty, windy periods.

MSU entomologists are doing a study to determine potential threat to Michigan grain crops by the greenbug. Farmers finding them should send them to MSU by way of their local county extension agent. If the pest is a threat, early control plans will have to be developed to curb crop damage.

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Central Michigan farmers, Allen, who is leading opposition to the tax in the Legislature, said he thought the farmers had made an excellent impression on the Taxation Committee, and said their involvement would be the single most important factor in stopping the proposed farm tax.

These were some of the farmers among more than 400 who came from various parts of the state to speak out against the sales tax proposal. Central Michigan Senator Allen, who is leading opposition to the tax, said involvement by individual farmers would be the single most important factor in stopping the proposed farm tax.

Backed by a display of nearly $200,000 worth of farm equipment, Michigan farmers mounted an impressive effort at "friendly persuasion" in Lansing last week, as they tried to save themselves and fellow farmers from a $15 million sales tax on their farm machinery. Farmers turned out in force to testify against the proposed 4% tax at a public hearing of the Senate Taxation Committee. And Central Michigan farmers, starting early in the morning, brought a variety of major implements to the front of the Capitol Building to dramatize the impact of the proposed farm tax.

The machines were hung with signs showing the enormous tax that the addition of several hundred dollars apiece on the sales tax proposal would add to farmers’ costs. The display was reviewed by Senators, government officials and legislative aides.

From the display of equipment it was shown that Karl and Jeni Forrel of Eaton County would have to fork over $520 in new taxes to replace their planter (replacement value: $12,000). Joe Harrigan of Ingham County would need another $1,300 just to cover the taxes for a new tractor like his present one (replacement value: $18,000). And to replace the $44,000 tractor-plow operating on the Harrington Farm in Eaton County would take $1,600 in taxes. And the Black Diamond Farm of Ingham County would be hit with a $1,300 tax bill for buying a $44,000 combine like the one they now operate.

These are just some of the examples among the implements displayed by the farmers at the Capitol. In fact, all the taxes on all the implements exhibited by legislators would total almost $7,500 if they were sold under provisions of the farm equipment sales tax bill.

Since farmers have to borrow to finance most equipment purchases, the addition of several hundred to over one thousand dollars to the purchase price would bite extra deep. In paying off their loans, farmers would be paying heavy interest not only on the equipment, but on the taxes as well.

Hundreds of Farmers Testify Against Proposed Sales Tax on Farm Equipment

Leading off testimony at the hearing was Joe Harrigan, whose Central Michigan district includes farmers in nine counties. Allen has been leading opposition to the farm sales tax in the Legislature. He aided farmers in their equipment display by obtaining permission from Lansing police officials and securing police escorts for movement of the machinery through the Capital City.

Allen said involvement by individuals farmers would be the single most important factor in stopping the proposed farm tax. He especially praised the powerful presentation by Central Michigan farmers, saying their testimony and display of farm equipment seemed to have a telling indirect effect on the mood of the committee and on their ultimate decision.

"In my opinion the excellent testimony, carefully organized facts and exhibits, and the fact that over 400 people came to Lansing to speak out against the bill make passage unlikely at this time," said Allen.

(Continued to page 16)
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Soil compaction--Symptoms in crops

In some fields, soil compaction symptoms may be readily seen in crops; but in others, the problem may be masked.

When symptoms of bad soil structure are visible, yields are usually reduced, say Michigan State University soil science specialists L.S. Robertson, A.E. Erickson and D.R. Christenson.

Under adequate moisture and high fertilization conditions, almost normal plant growth can occur in soil aggregates such as beans, corn and wheat. But with root crops as sugar beets, normal development is not likely despite the fact that top growth may appear normal. A good sized root is the basis for a profitable yield, but bad soil structure reduces root yields on all crops.

Obvious soil-tell symptoms of soil compaction include:

- Slow plant emergence, resulting in shorter plants.
- Off-colored leaves.
- Malformed roots.

**Slow Emergence**

Let's examine these three characteristics of a little more closely. Retarded growth rate can be a soil compaction problem, but don't overlook the possibility of nutrient deficiency.

Slow plant emergence can occur when the soil is wet, when soil crusts and when the soil is dry and cloudy. Under wet soil conditions and especially when it is cool, plant emergence from the soil is likely to be slow and less complete than normally expected. Water saturated soil excludes oxygen from the root zone and it suffocates. Under these soil conditions, both seedlings and the mature plants are susceptible to attacks by disease causing organisms.

Black root rot in sugar beets and Phytophthora root rot in alfalfa are good examples. Root rots on beans have long been associated with bad soil structure.

Soil crust can also slow plant emergence. Unless the crust is weak or unless soil or irrigation water softens the crust, emergence may be seriously impaired.

With dry, cloudy seed beds, there is inadequate contact between the seeds and the soil, so moisture absorption is slow and incomplete. Cloudy seed beds are soils with bad structure.

**Off-Colored leaves**

A second symptom of soil compaction is off-colored leaves which are often associated with low levels of available soil nutrients. Even though the soil may be high in nutrients, compaction can retard nutrient uptake.

The purple color sometimes seen on small currant plant leaves is frequently interpreted as phosphorus deficiency. On soils with bad structure, this color may also be a symptom of root development problems.

Off-colored leaves may also exist when oxygen is curtailed from the plant due to wet soil conditions. Nitrogen deficiency symptoms are frequently seen when the soil becomes saturated with water, even though high rates of nitrogen fertilizer have been used.

Denitrification, the loss of nitrogen to the atmosphere as nitrous oxide or as nitrogen gas, can take place rapidly when conditions are right.

Tests show 80 percent of the nitrate-nitrogen fertilizer may be lost in five days when the ideal conditions exist:

- A water logged soil.
- Soil 70 degrees or above.
- Good supply of organic matter.

**Malformed Roots**

Soil compaction is also indicated by "scraggly roots" and "dog leg" on sugar beets. A shallow, fibrous root system restricted to a few inches of surface soil is in danger of being a definite symptom of bad soil structure.

On Emer, "root lodging" may indicate soil compaction if the root occupies only a small volume of the soil, that is if fertility conditions are adequate, and if disease and insects are not present.

Other soil compaction guidelines include:

- Do the roots develop in a downward diagonal direction (good) or do they grow around the soil (bad)?
- Are the roots long enough to penetrate the entire root layer (good) or are they restricted to the plow layer (bad)?
Farm sales—but not incomes—shattered records in 1974.

Farmers earned an unprecedented $52 billion from sales in 1974, plus some $6.6 billion in Government payments. This drove gross farm returns an estimated $5 billion over 1973’s record.

Here’s the kicker:

The additional receipts weren’t enough to offset spiralling farm production costs. These boomed to an all-time high of 4.75 billion, trimming about 4 billion from the record 33.6 billion netted by farmers in 1973.

The gross income picture was divided sharply between the crop and livestock sectors. Crop receipts jumped roughly $2 billion over the 1973 record, but livestock prices fell a tenth, and receipts slumped about $2 billion, despite larger marketings.

As for net incomes, livestockmen probably absorbed more of the decline than crop producers, due to soaring feed costs and sagging slaughter cattle prices.

But cattle-feeders did get one break. Feeder cattle prices declined in 1974, unlike costs of most other inputs.

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(Left to Right), Porter Martin, John Kusnier, Bill Nemanis, Joe Mason, and Paul Nemanis.

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A good crop of alfalfa will surely improve your soil. The deep growing roots improve soil structure and aid water infiltration of the soil, while the nitrogen fixing ability of the legume increases the fertility of the soil.

Last winter a lot of alfalfa was winter killed and as you recall 80% of the winter killing occurred on April 18, 1973. The temperature went down to 24° F. and stayed there for twenty-four hours. The alfalfa killed mainly on areas where there was a lot of water held in the soil and/or areas that were not fertilized the previous year. Fertilizing your alfalfa, especially with potash, will reduce winter killing.

Here are a few ideas how to get and keep a good stand.

**WELL DRAINED SOIL**
- Alfalfa stand should be well drained - rolling or level - if high yields are desired. Alfalfa does not thrive on wet soils.
- Alfalfa will improve soil structure and aid water infiltration of the soil, while the nitrogen fixing ability of the legume increases the fertility of the soil. The alfalfa is wilt resistant. Five tons of alfalfa, generally of about 600 pounds, of 5-10-20 when seeded with oats or 8-28-28 when seeded with cottonseed, will improve the yield of the subsequent corn crop.
- Only with resistant varieties are recommended and they should be winter hardy or moderately winter hardy.
- For long-term stands, five years or more, Vernal, W.L.203, Superstand and Titan.

**GOOD SEEDBED - Minimum tillage in the spring - usually plowing and seed tilling operation before seeding - is adequate. In summer, a firm seedbed is required to prevent drying.

**INOCULATION - Inoculate seed by band before planting to be sure the plant acts as a nitrogen factory or buy pre-inoculated seed. Corn is nominal.

**ADAPTED SEED - Use recommended varieties, preferably certified, to insure genetic quality, high germination and establishment.

**SOIL TEST**
- Mainly to determine pH. Appropriate 1 to 12 months before seeding, to bring the soil pH to 6.8 or above, to ensure slow setting and requires time to correct soil acidity. Low pH is the main reason alfalfa yields are low. Corn may grow on a soil of pH of 4.5, but alfalfa will not do well. In rotation soil should be sweetened for alfalfa. This will improve the yield of the subsequent corn crop.

**BAND SEED ABOVE FERTILIZER - Plant in early April for best moisture conditions or late July or early August for summer seeding.

**RATE OF SEEDING**
- Ten pounds per acre for excellent seedbeds, band seeding with press wheels or cuttleracker after seeding. Twelve pounds per acre for moderately good seedbeds; seeding technique not ideal.
- Oat competition - Oat competition in spring seedings can be reduced by removing the oats early as tillage, preferably in the foot stage.

**SEEDING WITH WHEAT**
- Alfalfa should not be seeded in wheat in spring because of poor stands. Plowing the wheat stubble under and making a summer seeding in early August gives as good or better stands than spring seeded alfalfa.
- Seed winter hardy with phosphorus and potash, which results in top growth and winter hardiness.

**FALL MANAGEMENT**
- Summer seedings must not be grazed, clipped or disturbed during the fall of the seeding year. They need adequate time for root and top growth for food storage.
- Alfalfa stands (except summer seedings) can be cut in a fall without winter hardiness.
- Herbicides - With clear seeded alfalfa (seeded alone in the spring) Eptam works well. You can control annual weeds with 2 quarts of Eptam worked in (incorporated) to the soil immediately after application. If broadleaved weed problems develop after using Eptam then Betryn 110 can be used at a rate of 3 pints per acre.

**PREVENTING WINTER KILL**
- Seed winter hardy resistant varieties, seed on well-drained soils, fertilize annually with phosphorus and potash, especially potash, and correct the pH to 6.5.
- Preventing winter kill - Seed winter hardy resistant varieties, seed on well-drained soils, fertilize annually with phosphorus and potash, especially potash, and correct the pH to 6.5.

**HERBICIDES**
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**PREVENT SOIL EROSION**
- Seed winter hardy resistant varieties, seed on well-drained soils, fertilize annually with phosphorus and potash, especially potash, and correct the pH to 6.5.
The value of livestock manure is difficult to determine, but its worth rises with the increased costs of commercial fertilizers, says M.L. Vitosh, Michigan State University Cooperative Extension specialist. Nutrient levels of manure vary widely depending on the type of livestock, the feeding program and storage method. "Moisture and temperature are probably the most critical environmental factors affecting the nutrient composition of manure," Vitosh says.

Michigan studies have shown that the nitrogen content of manure from unsheltered or open feedlots is about half that of sheltered or totally confined livestock systems. The value of livestock manure varies widely depending on the type of livestock, the feeding program and storage method. "Moisture and temperature are probably the most critical environmental factors affecting the nutrient composition of manure," Vitosh says.

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Dollar value of manure rising

Manure containing bedding, such as straw or corn cobs, will normally have a higher nutrient level than fresh manure without bedding. This is because the bedding absorbs urine, preventing large losses of nitrogen by volatilization. Some nitrogen in open lots is also lost by run-off, deep percolation and denitrification (gaseous loss of nitrogen). Run-off, and deep percolation losses can pollute surface and sub-surface waters, so it's important to trap as much of the nutrients as possible.

Stockpiling, manure, storing for long time periods, have several advantages over spreading fresh manure: stockpiled manure is drier, having undergone partial composting, releases ammonia more slowly and weed seeds are destroyed by the natural heating and bacterial action within the stockpile.

Fresh manure has a high moisture content which means fewer plant nutrients are contained per pound. Large amounts of ammonia can be lost by volatilization if fresh manure is not immediately worked into the soil.

Liquid manure retains greater nutrient levels if worked into the ground immediately after spreading and will be more valuable than stockpiled manure. Not all manure nutrients are available for plant utilization the first year after spreading, but they will be in subsequent years. About 50 percent of the nitrogen and phosphorus in manure is available the first year. The next year about 20 percent of the remaining amount is utilized and the final 10 percent the third year. However, when consistent yearly manure applications are made, residual factors should be taken into account. For example, with 30 tons of manure applied annually containing 100 pounds of nitrogen; in the first year, only 50 pounds of nitrogen will be available to the crop. But the second year there will be 60 pounds available (50 percent), and remaining residue levels in the soil. The availability of potassium in manure is quite different. It is readily released from the manure and is considered 100 percent available the first year.

Proper application important

EAST LANSING, MICH. — Farmers may be able to offset high fertilizer costs with manure applications, but wise management is required.

The best guideline is to apply only enough manure to meet the nutrient requirements of the crop, says M.L. Vitosh, Michigan State University Cooperative Extension specialist. If manure is plentiful, its nitrogen content is usually the limiting factor. If the nitrogen requirement for corn is 150 pounds of nitrogen per acre and only 100 pounds of manure contains 10 pounds of nitrogen, the requirement will be 12 tons of manure each year. But because only 50 percent of the nitrogen is available the first year...
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FARM REVIEW

Examine reasons for preserving farmland

The farmer's stake in preserving agricultural land was discussed by university and
state agency experts March 19 during the 60th annual ob-
serve of Farmers' Week at
Michigan State University.

Sponsored by MSU's
Department of Resource
Development, the program
began with an infor-
mal visit with university
land use specialists,
Raymond Vlastin, chairman of
the Department of Resource
Development, opened part of
the program with a discussion
on the supply of agricultural
land and how much is enough.
Albert Allm, legislative counsel
for the Michigan Farm Bureau,
then discussed farmers' con-
cerns with the impending
problems of preserving
agricultural land in the face of
expanding populations and
burgeoning suburbs. The op-
portunities for preserving
agricultural land through
preferential taxation were
reviewed by Myron TCelsey,
extension specialist in the
Department of Agricultural
Economics.

(Continued to page 26)
Honey substitute could hurt Michigan Honey Industry

An inexpensive syrup derived from corn could have serious implications for Michigan's honey industry.

This is one of several management problems examined by beekeepers during Michigan State University's Farmers' Week, March 17-21. Speaking about the new syrup was John A. Root, vice president, A.I. Root Company, Medina, Ohio.

The new syrup contains about the same mixtures of sugars as honey but is cheaper to produce. "Not enough of this new syrup can be produced to satisfy domestic market demand and it has had a depressing effect on the bakery grade honey market," says Root.

He fears that if the honey industry cannot meet this competition, there could be serious problems for future pollination service. More than 90 agricultural crops need honey bee pollination for successive yields.

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Have you ordered vegetable seeds?

Homeowners will plant more vegetable gardens in 1975 than any prior year — over 60 million — more than twice the number of victory gardens planted during World War II.

Seed supplies seem adequate for the time but gardeners should order early and then only vegetable types which will grow well in their area, says Ear Robert C. Henner and J. Lee Taylor, Michigan State University horticulture specialists.

Buy only seed amounts you intend planting to prevent possible early shortages. Select varieties which mature during your area’s growing season. Michigan’s Upper Peninsula has from about 90 to 120 frost free days. The average in southern lower Michigan is 150 to 190 frost free days.

Don’t try to raise buttercup squash which has a 160 day maturity in some areas of the Upper Peninsula. The better choice would be a small bush type Acorn squash which has an approximate 80 day maturity.

Days to maturity are usually printed on the side of the seed packet. Details for variety performance, recommendations for home freezing, disease resistant varieties and new hybrids are found in mail order seed catalogues.

Homeowners should note new vegetable varieties released each year which may have better yield and/or higher quality than older or standard varieties.

However, excellent older varieties should not be discarded just because new ones are available. Test a few new varieties each year to see how they compare before discarding proven types.

New hybrids may show improved vigor with higher yields and may be more disease resistant than some of the older types. All-American varieties are selected each year based on tests throughout the country. Disease resistant or tolerant varieties should be grown where possible.

Additional information may be obtained from Extension Bulletin E-329 “Home Vegetable Garden” (25c) and from E-760(a) “Home Garden Variety Recommendations” (free).

The latter lists mail order seed companies and recommended varieties for 1975. Included are disease and tolerance indications, days to maturity for each seed variety and a map of frost free days of Michigan.
1974 - a look back

Nineteen seventy-four started as year of uncertainty for farmers. Uncertainty in the form of supplies of fuel, fertilizer, equipment and spare parts. In agriculture timeliness is exceedingly important. If fuel, fertilizer, spare parts, etc. are not available when needed, at planting time for instance, i.e., the week of May 16 severely curtailed the soil and caused a 10 percent loss of the corn in the county to be replanted. Early planted corn took 11 to 21 days to germinate causing some anxiety among farmers. The early planted corn out yielded the later planted even though it took longer than the usual 7 to 10 days to germinate.

Nearly all soybeans were plowed on time but cold wet weather delayed planting of many beans.

The cold wet weather shortly after school was out caused severe stress on the emerging crops and for about a week, until warm weather returned, many fields looked very sick.

Michigan to the south were under droughty conditions during the month of July. Clinton county wasn't so badly hit by the dry weather in July, although hay crops suffered and yields were down due to the dry weather.

Throughout the remainder of the growing season, rainfall was adequate and we received an average rainfall for the growing season. Crop yields were slightly below average for corn, and slightly above average for soybeans, wheat and oats.

Navy beans yielded well soil shorty after harvest the bottom dropped out of the market and prices fell dramatically. The yields of hay were less than normal due to a dry July.

The dairy farmer started out the year with a high price for his milk, but this faded fast to a memory. Milk prices declined through the year to the farmer and steeply increased cost pushed many dairymen into a no-profit situation. The price of dairy cows dropped during the year, so that farmers received significantly less for calf cows than the year before. The market for dairy calves disappeared.

A farmer sent three calves to market and after trucking and selling expenses, he owed eighty cents to have his calves sold.

Nineteen seventy-four was a year of low prices for cattle. Heifer feeders lost money on the cattle they fed out and dairymen also received the low cattle prices for their calf cattle and calves.

Application

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Spring manure applications may be effectively used if discrusted or plowed under shortly after application. Care should be taken to avoid soil compaction from heavy spreading equipment on water saturated soils.

You may apply manure immediately to the soil or wait until warm weather returns. Liquid manure may be spread on land and taken to the field, but must be applied in any case by the end of September for best results.

The best time to apply manure is during the fall when it can be worked into the soil. Applications on frozen and snow covered ground should be reduced rates and only on level, not rolling or sloping land.

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Protest tax

(Continued from page 8)

Among the arguments presented at the hearing were statements that agricultural costs had jumped 75% since 1972, and that the efforts of Michigan farmers had brought $1.5 billion into the Michigan economy last year (most of it going to people other than the farmers).

Farmers testified that they are willing to pay their share of taxes; that they're not looking for a free ride. But they are opposing a new, special tax on agriculture. And they said their exhibit shows that farmers have tremendous capital investment and borrowing costs in relation to the return they can realize from their production. Especially since they have a minimal impact on marketplace prices.

A Farmer's Creed

I believe a man's greatest possession is his dignity and that no calling bestows this more abundantly than farming.

I believe hard work and honest sweat are the building blocks of a person's character.

I believe that farming, despite its hardships and disappointments, is the most honest and honorable way a man can spend his days on this earth.

I believe farming nurtures the close family ties that make life rich in ways money can't buy.

I believe my children are learning values that will last a lifetime and can be learned in no other way.

I believe farming provides education for life and that no other occupation teaches so much about birth, growth and maturity in such a variety of ways.

I believe many of the best things in life are indeed free: the splendor of a sunrise, the rapture of wide open spaces, the exhilarating sight of your land greening with spring.

I believe true happiness comes from watching your crops ripen in the field, your children grow tall in the sun, your whole family feel the pride that springs from their shared experiences.

I believe that by my toil I am giving more to the world than I am taking from it, an honor that does not come to all men.

I believe my life will be measured ultimately by what I have done for my fellowmen, and by this standard I fear no judgment.

I believe when a man grows old and sums up his days, he should be able to stand tall and feel pride in the life he's lived.

I believe farming is one of the most prestigious occupations and can be learned in no other way.

I believe that by my toil I am giving more to the world than I am taking from it, an honor that does not come to all men. Examine reasons

Central Michigan farmers organized a display of nearly $200,000 worth of machinery as part of their effort to persuade legislators not to slap a sales tax on their equipment purchases. The purpose of the display was to dramatize the enormous impact the proposed tax would have on Michigan agriculture. For instance, the machinery in the foreground (from Harrington's farm in Eaton County) has a replacement value of $40,000 and, under the proposed bill, would have to tax $1,600 added onto the cost. Even though farmers are very upset over the tax plan, which would affect them alone, they were careful to present their case in a constructive and informative manner. That Central Michigan Senator Dick Allen obtained special permission from Lansing officials to bring his machines through the city and exhibit them, and arrange a police escort through the Capital City to minimize traffic congestion.

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Eliminate careless milk procedures

"You can lose a lot of money through careless milk procedures on your dairy farm."

Frank Nusse, herdman for 38 years at Michigan State University Experiment Station, Chatham, Michigan, said that by using proper techniques you can be assured of getting all the milk the cows are capable of producing and at the same time help prevent mastitis.

"Sure, antibiotics can cure some mastitis infections but prevention through proper milking, management and sanitation is the most profitable way to go," says Nusse. He recommends the following milking procedures:

1. Washudder and teats with an individual cow towel soaked in a disinfecting solution. Massage the udder to stimulate milk flow.

2. Strip milk from each teat, preferably into a strip cup, noting any abnormal appearance in the milk.

3. Put milkers on in about one and within three minutes after prepping the cow.

4. Watch machines during milking. Take out cows off when milk flow slows but be sure to check that each quarter is completely milked out; machine strip those that are not before removing units.

5. Don't overmilk; most cows will milk out in three to four minutes. Be sure to break the vacuum before detaching the teat cups.

6. Dip teats in an approved teat dip as soon as possible after taking the machine off the cow.

7. If the machine fails off a cow during milkling and gets dirty, wash the teat cups before replacing on the cow. This prevents passing the infection from cow to cow.

8. Make a note of cows that you suspect have a possible infection and watch them closely at the next milking.

9. Be in a good mood at milking time. Your groupsiness could upset the cows and cut down on milk flow.

10. Be in a good mood at milking time. Your groupsiness could upset the cows and cut down on milk flow.

"Treat cows that you definitely know have an infection. At times a minor infection can be cleared up by the Proper milking and by milking four or five times a day," Nusse says.

It's best to consult with your veterinarian on the antibiotics to use. Be sure to withhold all the milk of any cow treated with antibiotics for the proper time period described. Marking treated cows in some way will help other people who are milking know which are being treated.

Soil compaction

High fertility conditions and proper tillage content can make a big difference in the soil structure. soil management decisions and tillage, planting and harvesting tools alter the structure of the soil -- improving or decreasing the natural productivity. Compost soils represent one kind of soil structure. Compaction results from one or a combination of:

- High fertility conditions.
- Excessive irrigation.
- Excessive tillage.
- Crop residue levels.
- Farm implement design.
- Unintended field operations.

Structure is the arrangement of mineral particles in the soil. How loosely or how firmly the soil particles are located in relation to each other, determines the rate at which water and air enter and move through soil.

This relationship also determines the plant's ability to root readily throughout the soil volume and how effectively the roots can reach water, nutrients and oxygen.

Bad soil structure refers to the adverse conditions which inhibit a plant's normal growth. However, some soils with bad structure, those with higher amounts of clay and lower amounts of humus, may be naturally compact.

Other soils with bad structure may reflect upon the activities of the farmer in determining the moist conditions that sometimes exist during field operation. This occurs in those fields where creeps are moulded out in the fall and where the soil is worked too wet in the spring.

These indications or symptoms of bad soil structure can be observed on the plant as well as the soil.

Check infillings for stretching or cracks. Some lines will wear out faster than others. A good rule is to replace infillings after 800 to 1,000 individual cow milkings. Using three units on a 50-cow herd would mean replacing liners once a month. Other practices to follow include:

- Check paddators for dirt and wear at least once a month.
- Keep vacuum controllers working free and clean.
- Keep vacuum hoses from becoming kinked.
- Keep vacuum hoses from entering the milking equipment before each milking, using accepted procedures.
- Keep air hole in claw working free.
- Keep cow air hoses clean and check them for cracking.
- Wash vacuum line with hot water.
- Wash and sanitize milking equipment before each milking, using accepted procedures.

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Living with pests

Mass hunger and disease still exists in the world and in some places the outlook is bleak.

Despite improved farming practices, including the application of pesticides and fertilizers, world food production has barely kept pace with the population growth in this century and half of the world's population has an inadequate diet.

But for the first time in history, there is promise, at least in some parts of the world, of enough food and an environment virtually free of pest-transmitted diseases. And chemical pesticides have helped accomplish this.

Here in the United States, consumers spend less of their income for food than any other people anywhere. The chief reason is more efficient food production. Here, too, chemical pesticides make important contributions.

Despite the fears and real problems they create, pesticides clearly are responsible for part of the physical well-being enjoyed by most people in the United States. They also contribute significantly to the existing standard of living of other nations.

Pest control of some kind is essential because crops, livestock and people live in a potentially hostile environment. Besides competing for our food supply, pests may be disease carriers or sources of insects. Man co-exists with more than 1,000,000 kinds and fungi that cause 1,500 plant diseases, and with many hundreds of weed species — not to mention rodents and other vertebrate pests.

The United States still loses up to one third of its potential crop production to various pests. Without modern pest control, and that includes chemical pesticides, this annual loss in the United States would probably double. If that happened, it's probable that:

Farm costs would increase considerably (by as much as 40%).

The average consumer family would spend much more of its income on food (16%, vs. 10%).

The number of people who work on farms could have to be increased.

Pesticides are used not only to produce more food, but food that is virtually free of insects or damage from insects or diseases. Particularly in the United States, pesticides are often used because of public demand, supported by stringent government regulations for uncontaminated and unblemished food.

It is not an overstatement to say that, in the United States, pesticides have contributed greatly to the high quality of the food which we enjoy today and that they have saved countless lives, especially in tropical countries, and that pesticides have generally contributed to a higher standard of living for man in many countries of the world.

Pesticides, like automobiles, can create environmental problems, but in today's world it is difficult to get along without them. Many pesticides can be a hazard to living things other than pests, sometimes including people. This is especially true if they are not used or disposed of properly. However, modern techniques of food production and control of disease-carrying insects require pesticides.

The concerned citizen can be sure of one thing: all-or-nothing answers won't work. At our present stage of technology, banning all chemical pesticides would be disastrous. So would the opposite — completely uncontrolled use of pesticides.

Few persons in the scientific world, or government, or agriculture favor such extreme answers. Instead they suggest more effort on:

1. Continued development of new and better methods of pest control, including pesticides.

2. Effective regulations of pest control, based on scientific facts and broadly based social values.

There is another requirement, recognition by the public of the need to accept some risks, after carefully balancing them against benefits. This calls for more understanding by everyone of both the contributions made by pesticides and the possible problems that accompany their use.
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Clear seeded alfalfa: a bright alternative

“Clear seeding” of alfalfa offers a bright alternative for livestock farmers who have difficulty getting good seedings in oats or who have little use for outgrown oats. Farmers who want a high amount of home-grown protein for legumes grown for forage.

The new system calls for seeding alfalfa alone in April (the earlier the better) and harvesting three tons of clean seeded alfalfa cut two or three times in the seeding year. The new system calls for seeding alfalfa alone in April (the earlier the better) and harvesting three tons of clean seeded alfalfa cut two or three times in the seeding year. Lasher explains.

Three years of Michigan State University research shows that spring “clear-seeded” alfalfa yielded an average of 3.5 tons during the seeding year. Saranac alfalfa seeded on May 30, 1971, yielded 2.6 tons per acre when cut on July 30 and Sept. 22. In 1972 tests, Saranac seeded on April 10 yielded 4.4 tons in three cuttings — July 9, Aug. 20 and Oct. 27. In 1973 tests, Saranac seeded on April 27 yielded 11 tons in three cuttings.

Lasher lists some guidelines for successful clear seeding of alfalfa:
1. Correct the pH by liming to at least 6.5. Soil should be well drained and of good water-holding capacity.
2. Seed as early as possible in April on a well-prepared seedbed.
3. Control annual weeds with three pounds EPTC (Eptam) acid equivalent per acre sprayed on the seedbed and worked into the soil immediately after application. Or spray 3/4 pound 2, 4-D ester when the seedlings have two or three leaves, usually four to five weeks after seeding. If broad-leaved weed problems develop after using EPTC, 2, 4-D can also be used.
4. Inoculate and band seed 12 pounds of granular, fast-growing, wilt-resistant alfalfa such as Saranac. Saranac often yields a half ton per acre in 1971 trials. Seed rates of 20 pounds or more per acre gave no greater yields.
5. Fertilize according to soil test, and band the fertilizer under the seed for a quick start. Thirteen pounds of 0-14-42 will supply the phosphorus and potassium for a three-ton hay crop.
6. Use press wheels on the drill or caliper behind the drill to compact the soil around the seed and cover it shallowly for fast emergence.
7. Check the second cutting of alfalfa for leafhoppers in July and August. Spray with an appropriate insecticide if most stems have one or more leafhoppers. Insecticide cost per acre is about $1.50 for material and $2 for application.
8. Plan for three cuttings for more hay of better quality. Take the first when the alfalfa is flowering in early to middle July, about three months after seeding. Make the next two cuttings at six-week intervals — about Aug 20 and Oct 27. Three cuttings in 1971 tests yielded about 1/2 ton more than two cuttings.
9. For high second yields, repeat in the fall or next spring according to soil test.

"Clear seeding" of alfalfa offers a bright alternative for livestock farmers who have difficulty getting good seedings in oats or who have little use for outgrown oats. Farmers who want a high amount of home-grown protein for legumes grown for forage.
**Western corn rootworm a vicious enemy**

Worse than hail, and drought, unwanted as early corn producers, the western corn rootworm is going to cloud Michigan corn producers. “It came out of the west a crested of chlorinated hydrocarbon insecticides and is an increasing threat to our production. They must be alert to avoid damage by this pest,” says Dr. Robert L. Boggs, Michigan State University Cooperative Extension entomology specialist.

The pest destroys up to 20 bushels of corn to the acre through root tunneling and pruning, silk trimming, lodging, ear damage and plant vigor reduction. That adds up to 95 or $90 per acre, based on today’s market.

Since 1971 it spread from three southwestern Michigan counties (Cass, VanBuren and Allegan) throughout 48 others representing 87 percent of the state’s corn production.

What to Look For

The adult, western corn rootworm, emerges from soil late in July and August. It has yellow wings with black spots. It is distinguished from the striped cucumber beetle by its black hindlegs. The cucumber beetle is not a pest of corn.

Larvae feed on corn, tunneling and pruning roots. They are easy to see in soil adjacent to corn plants. Unwanted as early corn producers. -

They lay yellowish oval eggs in the soil near corn plant bases in August and September. Eggs overwinter, hatching in late spring, when soil is warm. Larvae (rootworms) are slender, white, cylindrical, having six small legs back of a tiny head, growing to about one-half inch long.

Larvae feed only on corn, tunneling and pruning roots. The adult, western corn rootworm also damages plant vigor and causes lodging, which results in large green islands as silage is cut and huge wadded masses when grain is harvested.

**Where to Look**

To check for adults and larvae:

- Check silks and tassels at flowering. If you find one adult per plant, that means you may have to start control next season. Apply insecticide if two or more adults per ear are found before seed sets. You’ll need to protect the seed set.

- Examine lodged and gusseted neck plants—where they are mature for root tunneling. Smaller roots will be completely rotted off by this time. Look for rootworms in slanted or wilted plants in late June or early July or plants lodged later in the season. Carefully check for adults at flowering time.

**How to Apply**

Treatment methods are: preplant broadcast, band application and cultivation band.

Preplant broadcast is spraying liquid insecticide or spreading granular insecticide over the entire field before planting. Apply immediately before final disking. This method is the most expensive of the three in terms of time, fuel and insecticide.

Cultivation, applications are made by spraying liquid or applying granular insecticide in three to four-inch bands on both sides of growing corn. This requires special equipment, but it is the only practical way to apply insecticides for rootworm control in growing plants.

The cultivator should be used to cover the insecticide immediately after application. Band application is the least and local expensive control method. Insecticide is placed in a seven-inch band centered over the seed row. It may be made at planting or between planting time and first germination.

**Rotation is Key**

Insecticides, however, will not have to be used if corn is rotated—western corn rootworm threats only after corn plantings. Chances of damage are frequent after three years or more continuous corn, but less with second-year corn. Advantages of growing corn continuous are over continuous corn should be carefully weighed against potential loss when pest appears.

A recent survey of six high producing counties discussed that corn grown, was continuous, due mostly to large acreages which could not be rotated.

**Advantages of Growing Corn Continuous**

- 97 percent of the state’s corn production.
- About one-half of the acreages which could not be rotated were corn.
- Nearly 150 laws and regulations governing the manufacture, handling and sale of food and feed are administered and enforced by the Consumer Protection Bureau of the Michigan Department of Agriculture.

**Recommendations for Control of Adult Corn Rootworm**

- Diazinon or prophos (Jolt, Furadan, Deltamethrin) or malathion (Jopel, Monterey). These insecticides should be used to control the rootworms in infested fields where rotation is not feasible. Remember that insecticides are poisonous to toads. Store and apply them with great care. Read label directions, making sure that you match the insecticide with the pest.

- Dyfonate or prophos (Jolt, Furadan, Deltamethrin) or malathion (Jopel, Monterey). These insecticides should be used to control the rootworms in infested fields where rotation is not feasible. Remember that insecticides are poisonous to toads. Store and apply them with great care. Read label directions, making sure that you match the insecticide with the pest.

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A recent survey of six high producing counties discussed that corn grown, was continuous, due mostly to large acreages which could not be rotated.
USDA Emergency, Disaster Programs Cooperating

USDA agencies, historically, have cooperated with each other; however, at the present time, FmHA and ASCS are engaged in a unique program of cooperation, whereby ASCS employees may be used for part-time and intermittent assistance to Farmers Home Administration.

Michigan State FmHA Director, Calvin Lutz, and ASCS Director, Don Diehl, are cooperating on an employee exchange program between agencies in order to serve farmers faster and more efficiently in their emergency programs.

Until 1975 ASCS programs have been developed, ASCS can loan some manpower assistance to FmHA and, at the present time, FmHA has the additional, heavy workload of the Emergency Loan Program.

A heartening change from the usually criticized, bureaucratic operations. This type of interchange of manpower from one agency to the other emphasizes the advantages of the service center concept being promulgated by the Secretary of Agriculture, Earl Butz.

The Service Center concept is to have all USDA agency offices located in the same town, in the same building, and joint space—where work can be exchanged from desk to desk, when the workload justifies. The trading of work as it used to be called on the farm is now new to rural agriculture, but such efficient use of manpower is recognized as a revolution in Federal Government bureaucracy. This one-stop, Agriculture Center concept will serve agriculture better and use government employees more efficiently.

The two agencies of ASCS and FmHA are involved in two, separate and distinct programs of each agency. Agricultural Stabilization is administering a Disaster Feed Grain Payment Program. When a natural disaster limits planting of feed grains or when a natural disaster limits the harvest, producers must have harvested less than two-thirds of their allotment times the farm yield. If any farmers have feed grains not yet harvested and anticipate the yield will be less than two-thirds of normal, they may apply at their county ASCS office for a payment under the Feed Grain Disaster Program. This should be done immediately. For information, contact your local county ASCS office immediately.

The program on which ASCS is assisting, FmHA is the Emergency Loan Program, whereby farmers who have suffered production losses due to a disaster equal to 10 percent of the loss of their total farming income are eligible for an emergency loan. To be eligible for this loan, he must be a US citizen; an established farmer who manages his own operation; must operate in a county where emergency loans are authorized; must possess the legal capacity to contract for a loan; and he must be of good character, with the industry, ability and experience to carry out his proposed farming operation.

FARM SAFELY
There is a tremendous carryover from 1974 and this will influence the market as much as the acres planted or the yield per acre of navies. I am guardedly optimistic in my outlook for navy beans.

Hay crops look like a good money maker. The market has been strong the last two years and I think hay can be an important cash crop.

It appears that a huge wheat harvest is coming. About all I can say is, it looks like a buyer's market, not a seller's.

The margin of profit in crop production is not very great due to rising costs and sinking prices, the people who do things in a least cost way and on time will maximize returns.

The livestock enterprises look brighter than the crop situation. The beef feeder will be better off this year than last. Mostly because he can buy feeders very reasonable. But pity the beef calf man, he has problems. The danger is to over feed the calf. Feeding is bunched, marketing. How are the crops? Falling this fall and feedlots fill up with cattle.

Don't look for any great price increase for Naval beans.

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Soil testing pays

Soil testing has always paid dividends. Fertilizer is increasing all the while, applying the correct analysis and amount of fertilizer will really pay off.

The price of fertilizer has increased tremendously this past year. Fertilizer is worth applying now. This is what the number of padlocks on barns says to me. A number of people bought fertilizer last fall and stored it over the winter. Behind locked doors.

With fertilizer priced high enough to have value, soil testing should rank high with your fertilizer program. You can't afford to be wasteful of fertilizer now.

Many people are applying lime. They should use a soil test to determine the amount per acre.

Lime has lots of good qualities. For instance, lime makes for most efficient fertilizer utilization, improves crop yields, and promotes longevity of alfalfa stands.

As fertilizer has gone up in price, lime has gotten more popular. Before applying lime, get a soil test to determine the amount needed. Lime needs time to change the soil pH. Lime applied now will be effective for 1975 crops. The old song "Don't guess, soil test" holds as true today as ever. Fall is a good time to take a soil sample and bring it in for testing. The soil is not too wet, fall is cool and fall is a good time to take a soil test.

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1975 forecast

By Bill Lasher, County Extension Agent

So far the year has been one of declining prices and increased costs. Prices received by farmers are down 25% from a year ago and costs are up 15%. It's a difficult thing, in April, to forecast yields and prices for the rest of the year.

There are many things that can alter the outlook as weather, exports, politics, consumer demand, etc. With all this in mind here is my forecast, perhaps weekly or daily forecast.

Crop yields will be about average. For corn, given intended acreage 4% less than last year, this is a very large crop. Depending on how evenly planted, about 220 to 240 a bushel. Soybeans are more popular now. Before applying fertilizer now and should use a soil test to determine the amount needed. Lime has lots of good qualities. For instance, lime makes for most efficient fertilizer utilization, improves crop yields, and promotes longevity of alfalfa stands.

As fertilizer has gotten more expensive, lime has gotten more popular. Before applying lime, get a soil test to determine the amount needed. Lime needs time to change the soil pH. Lime applied now will be effective for 1975 crops.
Choosing corn hybrids

For grain it is better to choose an early corn than a late corn variety. Extension bulletin "Michigan Corn Hybrids Compared, 1974" shows good yields do not depend on late maturity. Advantages of early-maturing hybrids are:
1. They usually mature before killing frosts.
2. Good-yielding early hybrids generally yield as much or more than late hybrids in many areas of Michigan.
3. Lower moisture at harvest permits safer storage.

Maturity. Advantages of early-yielding hybrids are:
1. Higher yields do not depend on late maturing hybrids which produce yield trials. Well-tested, new hybrids are worth trying. You may be able to use a new hybrid in a strip in the same field with your present hybrid.

Big package haymaking

Big package haymaking is rapidly gaining popularity among Michigan forage producers. But until all farms are equipped for this type of mechanization:

Consider your equipment before making costly investments, says Dr. Gerald D. Schwab, Michigan State University agricultural economist. There are basically two types of big hay packages. One involves rolling the hay from the windrow into a large round bale. The other type has the hay from the windrow and delivers it to a wagon which shapes the bale.

Within each of these categories there are presently at least five retailers of each type. The weight of packages can vary from about 1,200 pounds to 8 tons.

Choose early hybrids for late maturing hybrids with better records in your area. You should be able to improve your corn crop by trying one or more of the hybrids with better records in the yield trials. Well-tested, new hybrids are worth trying. You may be able to use a new hybrid in a strip in the same field with your present hybrid.

For information get Extension bulletin 431 "Michigan Corn Hybrids Compared, 1974" free from your County Extension Office, 1903 S. Oakland, St. Johns, call or telephone for your copy!

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Causes of bad soil structure

There are five basic causes of poor soil structure, and they can occur separately or in combination.

1. Poor drainage, excessive tillage, inadequate cropping systems, and tillage practices. Improper drainage and tillage may lead to compaction, which reduces air and water movement in the soil. Improper cropping systems, especially those that remove organic matter, can also contribute to compaction.

2. Excessive tillage results in the development of very small aggregates in the seedbed. They are less stable than the large aggregates, increasing the opportunities for crust formation and accelerated wind and water erosion. If there is no obvious reason for a given tillage treatment, it should not be done.

3. Cropping systems that are not closely involved with one of the large, aggregates, in the seedbed. They are less stable than the large aggregates, increasing the opportunities for crust formation and accelerated wind and water erosion. If there is no obvious reason for a given tillage treatment, it should not be done.

4. Unhealthy field operations. Whether it is tillage, harvesting or fertilizing to the field, unhealthy field operations add to soil compaction. Sometimes farmers must get on wet soils, but waiting as long as possible for soil to dry impedes the compaction process.

5. Poor implement design also adds to the compaction process. Using dual wheels is considered less damaging than tandem wheels. Plowing with tractor wheels in the furrow represents deep compaction. Sometimes farmers must get on wet soils, but waiting as long as possible for soil to dry impedes the compaction process.

When the wheels are entirely on the surface, some of the modern large tractors and implements result in fewer trips across the field and, therefore, less surface compaction.

Here’s a good idea

Staying alive is a good idea and it takes a little thought, and judgment and look to do a good job of staying alive.

Safety should be on your mind when operating farm equipment, especially harvesting equipment, because harvesting equipment - choppers, combines or even pickers all have a way of getting the crop into the machine. And the machine doesn’t know or care if its corn or soybeans or you that go into it. It will do its job of chopping silage or separating the grain from the chaff. If you get too closely involved with one of these machines, you could be chopped or separated just as the crop would be. The machine may not succeed in putting you through it, but you’ll be the worse off, that’s for sure.

I recently read some guidelines for living a ripe old age. First, pick your parents! If they lived to be 50 years of age, your chances of living that long are better than if your parents lived to be 70. Second, do things in moderation and third, be wise and work hard to avoid accidents. So when running farm machinery - read the operator’s manual and its comments on safe machine operation, keep all shields and guards in place, stop the machine before getting off and shut down the power before making adjustments, wear tight fitting clothing that won’t get caught in the machine.

In living a long life, don’t trust to luck too often, remember to look both ways when crossing the street and to operate farm machinery in a safe manner.
Tell-tale signs of soil compaction may be detected by examining the soil surface material. This is the portion of the soil directly exposed to weather and is easily affected by surface traffic, according to Michigan State University soil science specialists L.S. Robertson, A.E. Erickson and D.R. Christenson. Four symptoms of bad soil structure usually seen on surface soils are:

- Soil crusts.
- Puddled or standing water.
- Excessive soil erosion.
- Increased tillage power requirements.

**Soil Crusting**

Crusting is the most obvious symptom of soil compaction, occurring most commonly on fine textured soils having large portions of silt and clay. To some extent, crusting may occur on some of the sandier soils. When crusted soils are wet, the pores fill with water, greatly reducing the air exchange rate between the soil and atmosphere.

When dry, crusts physically limit plant emergence. Unless the crusts crack at frequent intervals, plants are likely to be reduced. Crusting may be a problem on heavier soils if they are fall plowed; especially if the plowing is followed by secondary tillage. Crapping and tillage systems also influence the nature of soil crust formation. On soils where livestock systems of cropping and hay production are performed, crusting is not as frequent as on soils used for cash cropping.

**Puddled or Standing Water**

Compaction may be indirect where there is puddling or standing water over long periods of time. If infiltration rates of water are very slow due to crusts or a compacted condition of the surface soil, plant growth and yields are likely to be restricted.

Surface compaction is evident when rain water collects in tractor and planter wheel tracks. This situation is observed more frequently today than in the past, especially on the very early planted crops such as sugar beets and corn. Excessive Soil Erosion

Excessive erosion, caused by rapid water run-off, may be a bad soil structure symptom. It also may be caused by untimely tillage operations or the lack of soil cover.

Keeping surface soils loose and composed of relatively large aggregates between the rows, permits water to enter the soil volume and less to run off.

**Higher Power Requirements**

Increased power requirements for tillage may also be a symptom of bad soil structure. Farmers have not generally recognized this because of the power availability on most farms. Regardless of this situation, more power is required to till a soil with bad structure than one with good. With deeper structure problems, tillage power requirements will increase.

**Check stored grain**

Check stored grain regularly, even when dried correctly. Here are some suggestions:

1. Open top door and smell grain.
2. Probe and check moisture.
3. Turn on aeration system, smell exhaust air and check grain temperature.
4. Check around bin walls and see if grain feels more moist than in center of bin.
5. If there are indications that grain is out of condition, take action immediately. Either aerate the grain, dry it more or move it to another bin.

Use aeration systems to chill the grain mass to near 40 degrees. Check with thermometer hung in the exhaust air stream. About 100 hours of fan operation are needed to lower the grain temperature 20 degrees at an airflow rate of 1/10 cubic feet per minute per bushel.

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Check bins for grain damage

Unusually high numbers of Michigan farmers have reported damage in stored grain in the form of insects. Damage is expected to persist into the summer, but producers could be in serious trouble when grains warm next spring," says Michigan State University extension specialists Drs. Robert Maddex and Robert Ruppel.

Your check list should include: 1) grain moisture; 2) crawling on the surface of the grain; 3) hotspots in the grain, and 4) insects and mildew.

Alternatives to infestations may include aeration and fumigation, transferring grain to another storage area, turning the grain in the bin to reduce heating or selling the grain now.

Aeration

Producers having fairly tight grain silos or bins may cut a hole at the bottom, inserting a coarse screen to hold grain in. Connect a duct to a fan outside the bin. Make sure fan and duct connections are sealed, so airflow will be adequate to create good air flow. Vent the silo so air flow through grain will match fan air displacement.

Use a fan providing 1/10 to 1/4 cubic feet per minute c.f.m. flow per one bushel of grain, or 100 c.f.m. for each 1,000 bushels of grain in storage.

Commercially available tube type aeration (100 to 500) can be inserted at the top or side of the silo. These units are about eight feet long and four inches in diameter, having a perforated plate at one end and fan at the other. They work fairly well for small grain silos having limited handling facilities.

Transfering

If producers have room to transfer the grain, make sure it runs over a piece of hardware cloth (three or four feet long) as it flows into new storage. This will help eliminate some of the contamination in the grain.

Fumigation

Fumigation may be done in storage areas that are fairly airtight. Put the fumigant on grain three or four days prior to aeration then make sure you aerate well.

Available materials are ethylene dichloride-carbon tetrachloride (Dow Fume-70) or methylene chloride.

BE EXCEEDINGLY CAREFUL WITH THESE MATERIALS. READ LABELS THROUGHOUT. APPLY ONLY ACCORDING TO DIRECTIONS. MAKE SURE ANOTHER MAN IS WITH YOU WHEN FUMIGATING.

Selling

If infestation is severe and you do not have adequate space or cannot afford to treat grain, you should sell the grain now. Conditions will only worsen as warmer weather arrives.

Infestation problems stem from last summer's growing conditions. Under the extreme dry conditions, grains had much more fibrous material and were more brittle than normal.

When frosts struck corn, kernels were soft and subsequeut adjustments allowed more cob particles than normal, making drying even more difficult.

These factors contribute to more heating within grain silos or bins than normal. Grains under 50 degrees F usually have no infestation problems.

To maintain control, producers should check grain bins for possible infestations at least once a week. Insects in the grain indicate damage is already being done, and eradication measures substitute revenge. Many hundreds of dollars are lost in grain quality every year from failure to inspect grain storage, recognize danger signals and take corrective action.
The corn rootworm comes in three types: the Northern, Western and Southern. The Northern is by far the most common in Michigan and in the country, although the Western has been found in the southwest corner of the county.

The corn rootworm has two bed habits. First, as a larva, it eats the roots of the corn plants, causing lodging and weakened plants, due to the loss of roots. Second, as an adult, he feeds on the silks of the ear and the stalks are usually curved (goose-necked) near their bases. This lodging starting at the soil surface greatly interferes with or prevents mechanical harvesting of the corn.

The rootworm has only one generation a year. It lays its eggs in the fall in the cornfield and the overwinter as eggs. Next spring if the field is put into corn again the larvae are ready to begin feeding.

Only if you are growing corn after corn will the rootworm be a problem. Planting the field to another crop, if only for one year, will break the corn rootworm's life cycle. The field could become re-infested when it is returned to corn, if there are plenty of rootworms in the neighborhood.

You can detect the presence of rootworms best by examining the lodged goose-necked plants for lack of roots and evidence of root tunneling. Seeing the adult feeding on the silks in the fall is not a sure sign you'll have rootworm trouble next spring.

If you have lodged goose-necked corn and adults in the fall, then if the field is not next year, corn rootworms will probably be there.

There are two types of control for the corn rootworm. The cheapest is to rotate your crops because the rootworm can only be a problem of corn after corn.

The other way is to use chemicals at planting time or before. These insecticides must be incorporated into the soil. Planter box treatments do not work to control the rootworm. Remember the insecticides used are poisonous and care must be used to handle, store and apply them.

Also, to keep residences out of milk, dairymen should avoid use of chlorinated hydrocarbon insecticides such as DDT, aldrin, heptachlor, lindane, chlordane, etc. Read the label before using any pesticide.

For more information and recommended insecticides and rates, get the Extension bulletin "The Corn Rootworm" free, from our office, 1003 S. Oakland, St. Johns.

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Use of lime

Lime is used to increase the pH of a soil which increases nutrient availability to the crop. The optimum pH for most field crops is between 6.5 and 7.0 for mineral soils and 5.5 to 6 for organic soils.

Lime takes time to raise the pH level to the plow layer. In six months or less the pH will increase by about 0.4 using the recommended amount and kind of lime. For example, two tons of lime applied now would change the pH from 6.5 to 6.5 six months from now. The lime continues to increase the soil pH at the same rate from that point onward. All lime recommendations are the amount needed to bring the plow layer pH up to a pH of 6.5. Applying more than 1.25 tons of lime per acre in any season is not recommended. Mineral soils with a pH of 5.4 or less need more than one application of lime to correct the soil pH.

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Subsurface soil compaction problems

Soil compaction problems are usually more than surface deep. They may extend to the subsurface materials which include all but a portion of the tillage zone or the plow layer.

Precise determination of problems in this area is done with electronic instruments and laboratory equipment, but some can be detected by observation, say Michigan State University soil science specialists L.S. Robertson, A.E. Erickson and D.R. Christenson.

Measureable characteristics of the subsurface materials include considerations of water and air permeability, soil strength and oxygen diffusion rates.

Air and Water Permeability

Slow oxygen diffusion rates can be exactly determined with special instruments. Such measurements are not likely at the farm, but is possible to observe very wet soil conditions where oxygen diffusion rates are likely to be slow.

Slow water permeability is closely associated with bad soil structure. Some soils which are either naturally compact or which have been compacted by man have a water permeability rate of less than a quarter inch an hour.

Other soils may have a water permeability in excess of five inches per hour. Such soils may be droughty.

Some farmers have modified their tractors using dual wheels on the "land" while plowing in an attempt to maintain high permeability rates.

Soil Strength and Density

Compacted soils are dense and frequently have great soil strength which may hinder root growth. Under extreme conditions, root growth into zones with high strength does not occur until after the soil dries enough to fracture. Then the roots grow into the cracks. An angular shaped sugar beet root is evidence of this situation.

Frequently, with deep compaction, it is difficult to obtain adequate crop stands. On those occasions, when an unusually wet fall is followed by an exceptionally wet spring, it is possible to see where compaction and great soil strength developed during seed bed preparation.

Oxygen Diffusion Rates

Slow oxygen diffusion may result in poor root growth and low crop yields. Diffusion rates are directly related to the thickness of the water film in the soil. In most soils, oxygen deficiency represents only a temporary situation, but it can have a profound effect on plant growth. A 24-hour duration of oxygen deficiency can kill sugar beets, navy beans and tomatoes during the early stages of growth.

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