

MSU Extension Publication Archive

Archive copy of publication, do not use for current recommendations. Up-to-date information about many topics can be obtained from your local Extension office.

Status and Potential of Michigan Agriculture Phase II: Hay and Forage
Michigan State University Agricultural Experiment Station and Cooperative Extension
Service

Special Report

Richard H. Leep, Waldemar Moline, Crop and Soil Sciences

Issued September 1992

6 pages

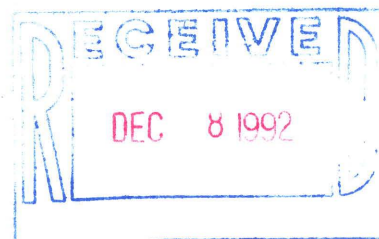
The PDF file was provided courtesy of the Michigan State University Library

Scroll down to view the publication.

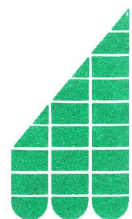
**SPECIAL
REPORT**

Michigan State University
Agricultural Experiment Station
East Lansing

**Status and Potential
of Michigan Agriculture –
Phase II**



**Hay and
Forage**



Reports on the Status and Potential of Michigan Agriculture

This special report is one of a series (listed below) prepared for a project of the Agricultural Experiment Station called the "Status and Potential of Michigan Agriculture."

The project was designed to take inventory of relevant research, identify trends and future scenarios of Michigan agriculture, and appraise the potential for growth. A purpose was to assist AES in establishing priorities and program planning.

The designation of "Phase I" refers to reports which provide general background information on the future economic, social, political and technical environment for agriculture. "Phase II" reports focus on major agricultural enterprises.

From mid-1990 to late 1991, some 70 faculty members and graduate students prepared drafts of

these reports which were subsequently reviewed by 100 other faculty members. These individuals were joined by nearly 150 industry representatives at a two-day conference during MSU's Agriculture and Natural Resources Week in March 1992. Based on the interaction with the participants at this conference, the authors prepared the final drafts of the special reports.

In a sense, reports such as this one should not be considered final drafts. Efforts to analyze the past and forecast the future should be ongoing. Even so, this report can be a very useful base document for further dialog on the potential for Michigan agriculture.

Status and Potential of Michigan Agriculture List of Reports

Special Report (SR) 32—Status and Potential of Michigan Agriculture Highlights

Phase 1

- SR 33—Michigan Agriculture in the Eighties
- SR 34—The Changes in Michigan Agriculture: 1950-1987
- SR 35—The Status of Michigan Agriculture and Its Resource Base
- SR 36—The Competitive Position of Michigan Agriculture and the Food Industry
- SR 37—Food Processing and Marketing
- SR 38—Agricultural Input Supply
- SR 39—Community Resources and Restraints
- SR 40—Michigan's Agricultural Policies
- SR 41—A Comparative Trend Analysis of Funding for the Michigan Agricultural Experiment Station and the Cooperative Extension Service
- SR 42—National-International Agricultural Outlook to the Year 2000

Phase 2

- SR 43—Dairy
- SR 44—Beef
- SR 45—Swine
- SR 46—Poultry
- SR 47—Small Ruminants
- SR 48—Horses
- SR 49—Fur Bearing Animals
- SR 50—Aquaculture
- SR 51—Corn and Soybeans
- SR 52—Sugar Beets and Dry Beans
- SR 53—Wheat, Oats and Barley
- SR 54—Potatoes
- SR 55—Nontraditional Field Crops
- SR 56—Hay and Forage
- SR 57—Tree Fruit
- SR 58—Small Fruit
- SR 59—Vegetables
- SR 60—Nursery and Landscaping
- SR 61—Christmas Trees
- SR 62—Turf and Lawn
- SR 63—Floriculture

Hay and Forage

Richard H. Leep and Waldemar Moline
Department of Crop and Soil Sciences

Introduction

Hay was Michigan's second leading crop in value of production in 1990. The 1990 crop was valued at \$339,875,000, up 130 percent from a decade ago when it was valued at \$147,752,000. During the past decade both acres and tonnage harvested increased. Acres harvested rose 12.7 percent to 1,450,000 acres and tons harvested increased 43.6 percent to 5,335,000. Nineteen-ninety produced an average record yield of 3.68 tons of hay per acre, up nearly 10 percent from the previous record set in 1989 at 3.36 tons per acre. Alfalfa accounted for more than 90 percent of the total hay crop. When U.S. alfalfa acreages by state are summarized for 1988, Michigan ranked 10th in the country in tonnage of hay produced (Table 1). In addition, there are an estimated 2,300,000 acres of permanent pasture in Michigan. U.S. hay supplies, which include May 1 hay stocks and annual production from 1979 to 1990, are given in Figure 1.

Trends in Hay and Forage

During the past 20 years, some significant changes have occurred in the hay and forage industry. With the development of near-infrared reflectance spectroscopy (NIRS) and its application for quick estimate of forage digestibility and acid detergent fiber (ADF), much of the hay throughout the nation is sold on the basis of quality measured by the NIRS test. However, only a small portion of NIRS-tested hay is sold in Michigan. Even with NIRS, researchers need to develop methods to better measure forage quality as it correlates with animal performance. The development of harvesting equipment such as big round balers and the trend toward ensiling haylage has reduced labor requirements for hay and silage production. Researchers need to continue to evaluate methods to lower the cost of harvesting, storing and delivering high quality forages.

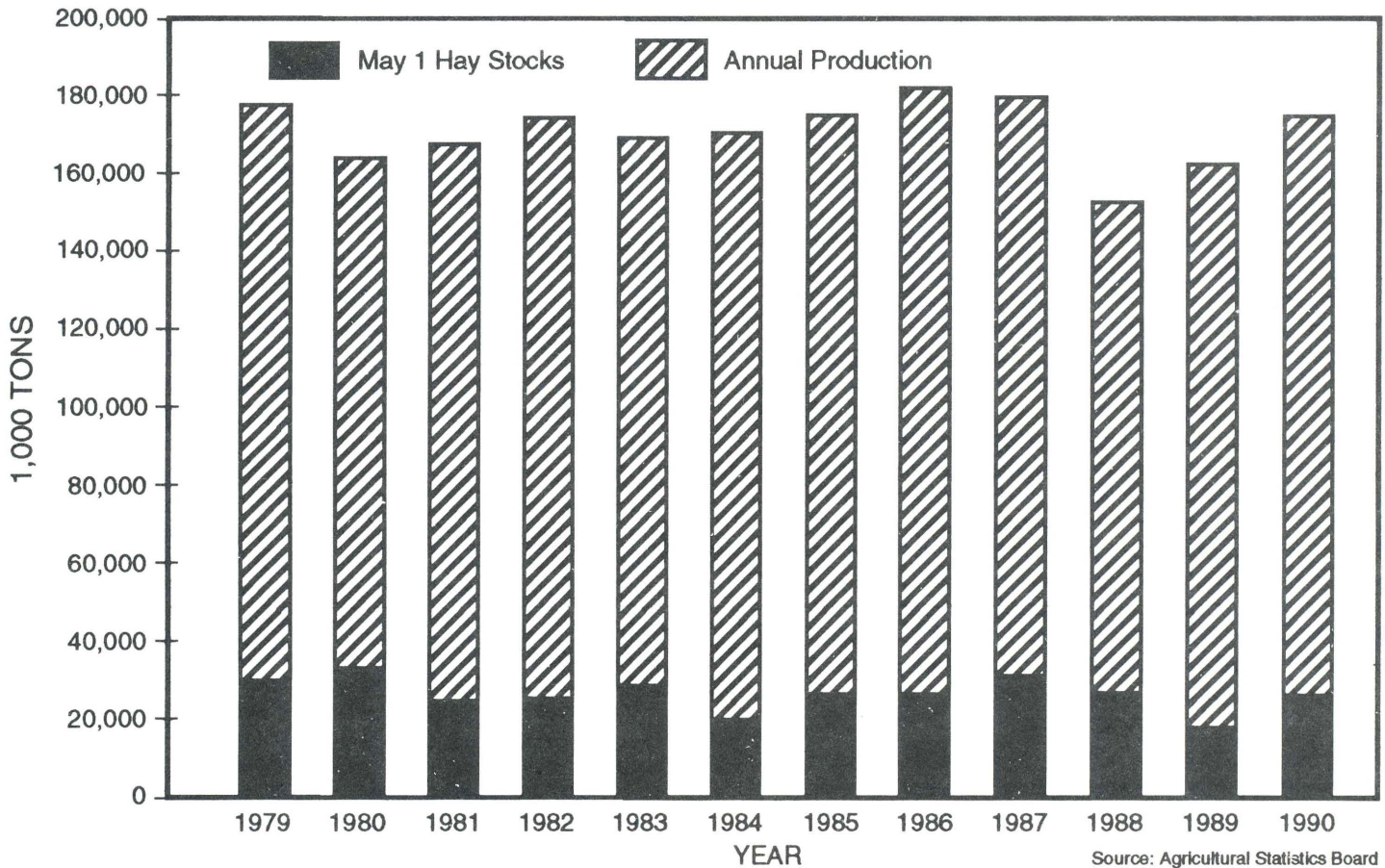
Yields of alfalfa have increased, as witnessed by a record 10-ton per acre dry-matter yield produced in East Lansing, Michigan in the late 1970s by Dr. Milo Tesar and later by other researchers throughout the U.S. Increasing hay yields are also well documented in the annual Michigan Agricultural Statistics reports. The increased yields have been attributed to improved management techniques such as proper fertilization, timely harvesting, insect control and improved varieties. There has been a trend toward more frequent harvests to improve forage quality and to reduce damage from insect pests such as alfalfa weevil and potato leafhopper. Producers continue to emphasize high quality forages which reduce their expenses for protein-supplement feeds.

TABLE 1:
U.S. Alfalfa Acreage

Areas in U.S.	1,000s of Acres
Upper Midwest	39.90%
WI	2,800
MN	1,700
MI	1,180
IA	1,450
ND	1,600
SD	2,350
	11,080
Central Midwest	7.32%
MO, IL, IN	1,370
Northeast	12.14%
OH, PE, NY	2,505
Northwest	
WA, OR, No NV, No CA	1,212
Intermountain	9.68%
No UT, CO, Wy, ID MT (irr), MT (dry)	4,140
Southwest	14.86%
So CA, So NV, So UT AZ, NM, SW TX	1,533
Southeast	3.61%
AK, TN, KY, VA NC, SC, LA	591
Plains States	7.07%
NE, KA, OK, TX	2,634
Total 33 States	25,065
Total All	25,485

* Source: Agricultural Statistics Board,
January 1988

FIGURE 1
U.S. Hay Supplies
1979-90



Grazing of pastures has attracted livestock producers' interest. The importation from New Zealand of materials and technology for portable and high-tensile fencing materials allows for low-cost intensive management of pastures. Similarly, interest has increased in balancing rations through alternative forage sources such as improved perennial grasses and other forage species. Producers are asking which species are best adapted to intensive rotational grazing; researchers need to determine the answers. Forages also need to be evaluated for their stockpiling potential in grazing systems.

Forages also play an important role in the agricultural environment. They are becoming more important in crop rotations, cover crops, land stewardship, aesthetics, and wildlife impacts.

Trends in the 1990s

Research in the 1990s will address current hay and forage production problems including the development

of simulation models to improve the sustainability of dairy farms. Research agendas include hay drying systems; optimum ratios of alfalfa and corn silage for dairy farms; and grass growth, harvest, storage and utilization in crop rotations. Other issues which will be researched will be pasture systems; legume-grass mixtures; forage preservatives; grazing systems; large-bale silage quality; impact of alfalfa-grass intercrop on alfalfa insects; insect control strategies with less chemical inputs; improving prediction of energy content and quality of forages; refinements in feeding forages in dairy rations; use of forages in crop rotation systems; improvements in establishment; breeding of varieties with high quality forage and pest resistance; and uses of specialized forage species.

Hay and forage acreage should remain stable. Improvements in production and management of the crop will result in higher yields of quality forage to meet the needs of a stable dairy herd and increased use of stocker beef cattle for grazing. There will be continued demand for baled hay for the state's equine population,

livestock producers will continue their trend to more silage and large-bale operations in an effort to reduce labor costs. A cash market will continue to exist for hay. Much of the hay sold for cash will be excess produced on livestock farms and will be sold to areas of deficit hay production.

Projections to the year 2000

Although production of hay and forages may decline in acreage, the decline will be offset by increases in total production. Hay and silage will continue to be the cornerstone of stable animal agriculture in the state. Michigan forage producers will continue a trend toward using less small-package-baled hay and more silage due to shrinking labor resources and the use of total mixed rations for dairy cattle. Hay and silage production will become more specialized, with dairy farms using specialized species to fit into the ration. The maceration and mat-drying system will become a small but important part of the forage industry. This new system will provide the ultimate forage for high-producing animals. Some growers will specialize in harvesting and marketing macerated as well as other types of hay for livestock producers. Pastures will continue to be an important source of forage to meet the demands of stocker beef, cow-calf and dairy enterprises. Improved pasture management (including intensive grazing and new varieties of legumes, grasses and other plant species) will result in more net income for livestock enterprises.

In a move to become more efficient and reduce costs, more bunker silos or piles will be used for alfalfa silage. Alfalfa will continue to be the dominant forage species for hay and silage. There may be alfalfa hybrids which can provide a 20 percent increase in yield beyond

today's varieties. Non-bloating alfalfas which can be grazed directly anytime will probably be available. Alfalfas will be developed which are highly persistent in pasture. Alfalfas will have high quality proteins that resist degradation in the rumen, thus passing to the intestine for digestion and resulting in a significant increase in animal performance.

Michigan has a tremendous potential for hay and forage production in terms of soils and climate. The production and limits of growth will continue to be directly correlated with the growth of the dairy and livestock industry and its demand for forages. There may be potential for increasing hay exports from Michigan if the western United States allocates less water for irrigation of hay.

Sources:

Brown, R.J. 1990. Farmer experiences with intensive grazing. Proc. Dairy Feeding Symposium, p. 228-235. Northeast Regional Agric. Service. NRAES-38.

Fales, S.L. and L.D. Muller. 1991. Stocking rate effects on pasture growth, forage quality, forage utilization, and on milk production by dairy cows under intensive rotational grazing. Agronomy Abstract, p. 187. Agronomy Society of America, Madison, WI.


Elgin, Jr., J.H. 1991. Alfalfa Varieties for the 1990s. Proc. 21st National Alfalfa Symposium, pp. 79-80. Certified Alfalfa Seed Council.

Undersander, D. et al. 1991. Wisconsin Pasture for Profit. University of WI-Extension. A3529.

Michigan Agricultural Statistics - 1991. Michigan Department of Agriculture. USDA/NASS #075.

The Michigan State University Agricultural Experiment Station is an equal opportunity employer and complies with Title VI of the Civil Rights Act of 1964 and Title IX of the Education Amendments of 1972.

New-9:92-2M-TCM-UP

 *printed on recycled paper
using soy based ink*
