ENTOMOLOGY

John T. Schultz, Chairman

There probably is no other time period in the history of the Department of Entomology in which more significant advancements were made than the years 1956-1978. This period embraced the "heyday" in the dependence and use of insecticides for pest insect control. It also embraced the post "Silent Spring" era that has brought with it reservations and concerns about our dependence on these chemicals and the environmental and health problems which they may produce. During this 22-year span we also have witnessed the creation of a Federal Agency (EPA) which has a strong mandate to monitor and control chemical use and prevent deterioration of our environment. This agency has broad and encompassing regulatory powers which materially affect research efforts on pest control. The concept and practice of integrated pest management (IPM) has been the focus of a major national effort in the latter part of this period. IPM carries with it the need to define economic threshold levels of infestation, develop predictive models of pest populations and continue research efforts toward development and use of less persistent chemicals.

In North Dakota this has also been a period of change; new production technology, increases in crop and livestock production and introduction of new crop commodities all have had impacts on the management of insect pests and the preservation of beneficial species.

These, along with other problems and concerns, mandated a need for the Department to expand its research and teaching capabilities. We have appreciated the recognition of these needs by Dean and Director Arlon G. Hazen and his support in helping us meet them.

The growth and development by the Department is reflected principally in three areas, personnel, programs and physical plant.

Personnel:

From a teaching and research staff of four in 1956, the Department now has eight entomologists with responsibilities in these two areas. Five entomologists from the USDA-Metabolism and Radiation Research Laboratory hold adjunct appointments in the Department. Several of these have been engaged to teach courses in specialized areas from time to time; others are involved in cooperative research endeavors with Departmental staff. Two Extension entomologists integrate their activities with the teaching and research staff. The Department also houses the Associate State entomologist (State Department of Agriculture) and the staff utilizes the survey information which he generates in their extension and research programs. The most significant change in personnel during this period is reflected in the technical aide and graduate support. The Department now employs three technicians; graduate students in residence number 20, about four times the size of the graduate program in 1956. The ability of the Department to pursue the diverse areas of research it has been able to undertake is directly related to the strong graduate program that has been developed.

Programs:

Both teaching and research programs have changed markedly in this 22-year period. With the diversity of background possessed by staff of the Department, course offerings at both the undergraduate and graduate levels have doubled since 1956. Entomology was one of the original Departments that received approval to offer the Doctor of Philosophy degree in 1960. While the Department remains predominantly a graduate student department, high undergraduate enrollments in several courses in recent years reflect a recognition by students in other agricultural and biological disciplines of the necessity to increase their familiarity with insects.

The Department continues to have major commitment to research on the insect problems of row crops. The newest commodity, sunflower, has received major emphasis since 1967. A major program dealing with livestock insects was launched in 1974. Baseline data on insects has been accumulated from areas of the state where major changes in the aquatic or terrestrial topography are likely to occur; two areas emphasized have been the Sheyenne Valley (Kindred dam) and Southwestern North Dakota (lignite mining). Major emphasis in augmenting holdings of the North Dakota Insect Reference Collection has resulted in a collection of over 500,000 specimens. This collection is the basis for response to the questions, "What is it? Is it dangerous? How do I control it?" and is indispensable to teaching and research programs. Research on biological and cultural control of insects has been accelerated and now embraces all projects dealing with pest insect species.

Physical Plant:

After being housed in a multiplicity of structures for many years, the Department moved to new facilities in Hultz Hall in December 1977. For the first time the

Department has facilities designed for entomological research. Also for the first time in many years, all staff and graduate students are housed in the same facility.

Future Activities:

Management and control of pest insect species on many commodities will involve an integration of many approaches with less reliance on the use of pesticides than presently employed. Development of crop varieties resistant to insects, increased utilization of biological control agents and use of cultural techniques will be actively pursued. The integrated pest management approach is currently under evaluation for the sunflower insect complex and may be implemented on a broad scale. With increased emphasis on environmental impacts, the Department will continue to expand on its establishment of baseline data for insects in areas of the state undergoing major energy-related development. There will be increased emphasis on the role of insects as possible control agents for weeds.

Departmental staff have always attempted to maintain a versatility that will permit response to the changing needs of North Dakota citizens. The Department looks forward to a continuance of this capability and the ability to provide service to all who may request it.

HORTICULTURE AND FORESTRY

E. P. Lana, Chairman

The importance of horticulture was recognized early when the institution was founded in 1891. Its first staff member, C. B. Waldron, was designated Professor of Horticulture and Forestry in the College of Agriculture and arboriculturist in the Experiment Station. In the succeeding years a major objective of the department was to select and develop new and better vegetable, fruit and ornamental cultivars for the citizens of the state and the agricultural industry. Other objectives included the development and use of shelterbelts for protection of man, crops and animals; the use of esthetics to better living conditions for rural and urban North Dakotans; and the improvement of cultural practices in horticultural crops. Since 1956 the same purposes, somewhat modified by agricultural population and social changes, are still predominant.

Horticulture is an area that deals with meeting people's needs as much as it does with crop production. The esthetic aspect, which affects all persons, is difficult to measure in the dollar and cents economy. However, those who have lived in the state for the past quarter century can begin to see the tremendous advances made in horticulture-related beautification. Greenhouse, nursery and flower shop production have increased. Landscaping of public areas — schools, roadsides, municipal buildings, industrial sites — have become a fact. Homeowners of the state now take pride in well-landscaped and horticulturally developed yards.

Agriculturally, the potato ($80 million per year) is the main horticultural crop produced in North Dakota, and the state ranks fifth in United States production. This production has expanded with the increase in popula-