

# AGRICULTURAL ENGINEERING ACTIVITIES IN CANADA

## PRESENT AND FUTURE

### EDUCATIONAL ASPECTS

by  
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#### *Present Facilities and Programs*

A review of the Agricultural Engineering Programs offered at institutions in Canada can be summarized by the following statement and table.

All Agricultural Engineering De-

partments offer some courses in the traditional fields: power, machinery, soil and water, structures and electrification. In addition, the Engineering Science Department of Ontario Agricultural College offers a number of

basic engineering courses.

Most Departments are well equipped with typical Agricultural Engineering facilities (dynamometers, fuel and oil equipment, hydraulic laboratory, irrigation equipment).

TABLE

Department	Faculty Administration by:	Degrees offered	Staff	
			Full Time	Part Time
MacDonald College (McGill)	Agriculture	B.Sc. (Agriculture) major in Ag. Eng.	3	—
O.A.C. and Univ. of Toronto	Agriculture (O.A.C.) and Engineering (Univ. of Toronto)	B.S.A., M.S.A., (Ag. Mech.) B.A.Sc. (Mech., Civil)	19	2
Manitoba	Agriculture	B.S.A. (Ag. Mech.)	1	—
Saskatchewan	Engineering	B.S.A. (Ag. Mech.) B.E., M.Sc.	8	10
Alberta	Agriculture	B.Sc. (Agriculture) major in Industrial Ag.	2	—
British Columbia	Engineering and Agriculture	B.S.A., M.S.A., B.A.S.c.	5	2

#### *Recent and Proposed Developments at the various colleges in Agricultural Engineering Teaching*

##### *Macdonald College*

Some changes in courses are planned so that students graduating from Macdonald College in four years from Junior Matriculation with a B.Sc. (Agriculture) can enter McGill University and obtain a Professional Engineering (B.E.) degree in two years of further study. This degree would be in the Mechanical Engineers specialty.

It is also stated that increased emphasis will be placed on fundamental engineering science to keep pace with contemplated changes at McGill.

Research work will be increased materially and a research and teaching appointment is expected.

##### *Ontario Agricultural College*

Present plans at Ontario Agricultural College call for a re-scheduling of some of the engineering courses to bring them in earlier in the program. An increased emphasis will be given to Agricultural Engineering and decreased emphasis on Agricultural Mechanics.

A future objective is a 4 or 5 year degree program in Agricultural Engineering. To achieve this, further emphasis will be given to physical and

engineering sciences with a better integration of biological sciences and more functional agricultural courses.

Research will be expanded to permit broader post-graduate teaching at the Master's level. The Ph.D. degree is another future objective.

##### *Manitoba*

A new curriculum was put into operation for the 1957-8 session. Two degrees are offered: B.S.A. and B.S.A. (Hon.). The B.S.A. (Hon.) is designed for students going into research. The B.S.A. general degree has a number of sequences, including Agricultural Mechanics, available to the students.

The Agricultural Mechanics sequence now provides increased work in the Physical Sciences and Humanities while the Biological Sciences have been reduced. It is felt, however, that the students coming into third year are overbalanced in the Humanities, Social and Biological Sciences and are still lacking in Engineering background.

An immediate objective is to increase the academic staff to three. This would allow an increase in the number of classes offered to Agricultural students.

##### *Saskatchewan*

It is planned that classes in Rural Electrification and Processing be offered to Agricultural Engineering students as soon as possible.

##### *Alberta*

A major in the Department of Agricultural Engineering, tentatively called Industrial Agriculture has been added to the recently revised Agricultural curriculum. The main emphasis in this major is on Agricultural Production Engineering.

For this major, the Department of Agricultural Engineering offers a course in Production Engineering as a third year requirement together with fourth year courses in Heating, Ventilating and Air Conditioning; Structures; Power Units and Agricultural Machine Elements; Materials Handling and Processing; and a Project course associated with the problems involving materials handling, equipment selection and production layout.

##### *British Columbia*

The Department stated that they are unable to reveal proposed changes at the present time.

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relative to these activities to warrant their inclusion in this paper.

Without adequate extension the

work of education, research and to a lesser degree, industry, loses much of its value insofar as benefits to the Agriculture of Canada is concerned. Those charged with the responsibility

of directing education have a heavy responsibility to assure that top calibre men are available for the field of Agricultural Engineering Extension as well as for Research and Industry.

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### Summary

In review, we find that the following programs are offered across Canada:

(1) Farm Mechanics major in College of Agriculture—offered by Macdonald College, Ontario Agricultural College, Universities of Manitoba, Saskatchewan and British Columbia.

(2) Agricultural Engineering degree in College of Engineering—offered by Universities of Saskatchewan and British Columbia.

(3) Other Engineering degrees, where the degree is other than Agricultural Engineering but the background is certainly Agriculture—Civil and Mechanical Engineering degree offered jointly by Ontario Agricul-

tural College and University of Toronto.

(4) Industrial Agricultural major in Agriculture—offered by University of Alberta. Here the field of Industrial Engineering has been transposed to Agriculture and the course of studies has been called, tentatively at least, Industrial Agriculture.

### Conclusion

A reference to the Gordon Royal Commission will point out that Agricultural output is expected to expand with an accompanying decrease in farm population.

This indicates the increased importance of well-engineered farm enterprises for the future. As capital investment in farms increases, so does the responsibility of the agricultural

engineer who will be increasingly called upon to advise on decisions involving outlay and layout.

As an example, a mistake in designing a ventilation system for a poultry house to hold 50 birds is less easy to detect and produces less severe repercussions than a similar mistake in a house to hold 5,000 birds.

Also, with the continuing cost price squeeze, production methods and techniques assume much greater significance.

Based upon these considerations, educational programs for the future must provide:

(1) Sound fundamentals in engineering theory and

(2) Increased appreciation of the economic factors relating to agricultural production.

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laboration between Sciences.

C—Determine technical inter-relationship of a farm enterprise as a production process.

D—Consider welfare of farmer as an individual in the community.

E—Other problems—Low cost buildings, feed handling, labor efficiency, farm safety and optimum investment in machines.

In an economic problem many factors are related and evaluated to ob-

tain a practical solution. Several economists suggested that it would be desirable for Agricultural Engineers to consider the broad implications of a problem when determining the solution, in an effort to evaluate the effect on the farm enterprise.

### Conclusions

While there are individual problems that can be handled by Agricultural Engineers alone, there are many more problems that should be attack-

ed with the co-operation of other research fields. Co-operative projects will no doubt increase as research workers realize that the complete solution of a problem involves many related operations.

As a result of more co-operative research projects, the Agricultural Engineers would be able to concentrate on the basic engineering phase of research. Engineers would be expected to accept greater responsibility in pure engineering research as an integral part of a co-operative project.



CANADIAN AGRICULTURAL ENGINEERING SOCIETY