

FIVE YEARS OF MEY EXTENSION ON IRRIGATED CEREALS
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MEY on irrigated cereals . . . Why? "Why do you guys on irrigation grow wheat?"

That is the question we get asked most frequently by people not associated with irrigated crop production, be they farmer, agrologist or whoever.

The answer is simply, we have no choice; cereals must be included in the crop rotation to allow for disease control, weed control, insect control and marketing. About one half of the intensively irrigated acreage in Saskatchewan is planted to cereal grain each year.

Until about five years ago almost all of our extension effort was directed toward special crops.....forages.....oilseeds.....or anything except cereals, which everyone knew shouldn't be grown under irrigation anyway. It gradually dawned on us that in spite of all our efforts the cereal acreage was actually increasing. A little more thought brought to light the fact that cereal grains were a necessary part of almost every crop rotation we could think of.

A logical extension of that line of thinking was we should spend more time and effort improving the profitability of cereal grain under irrigation.

Five years ago, Maximum Economic Yield was not part of our vocabulary, we simply tried to identify ways that growers could increase their yields and their profits. The term MEY did not enter the picture until about year three.

The first step in our MEY program was the elevation of cereal grain production to a level equal to special crops, oilseeds and forages.

Our core program was irrigation scheduling. In this program the agrologists and technicians of the Irrigation Branch, as we were then, installed moisture monitoring equipment and made bi-weekly visits to the irrigated fields of interested farmers. During these visits we checked the soil moisture status of the field and the crop growth by walking into the field at three or four locations. The farmer was encouraged to accompany us on these little walks and often did. A written report on the moisture levels and irrigation recommendations was left with the farmer.

The irrigation scheduling program served an identified need. All dryland farmers getting into irrigation must learn a lot about water application, water movement and crop water use if they are to get the maximum economic yield from their crops. It also provided us with an entry onto the farm and into kitchens where we could discuss crop production techniques with the irrigators. These discussions were definitely two way, with the agronomists learning at least as much from the farmer as vice-versa. And isn't that the key to extension?, the transfer of information not from source to sink but from source to source.

Each of us worked with 10 to 20 irrigators per year on this intensive level and four or five times that many once or twice per year. There were frequent staff discussions to exchange information and ideas so that if one individual found something that seemed to work well it could be checked out by the others. Production practices such as seeding equipment, date and rate, fertilizer amounts, type and timing and of course irrigation management were the major points of emphasis. Nothing earth shattering, nothing new, nothing every ag rep in the province wasn't already doing, except we were making about

ten calls per summer to each farm and usually for two years with less frequent calls in subsequent years.

The regular visits to the same fields allowed us to notice things we would otherwise have missed; things like tiller die-back, short-term moisture or heat stress and disease development. The multi-year approach gave us a chance to see what, if any, effect this program had on the crop production practices of our clients and on the crop yields, and to refine our recommendation to that grower. The best way to intensify crop management is to intensify crop management extension. MEY extension is a lot more than handing the farmer a pamphlet or making a fertilizer recommendation. It must be done on the farm and in the field.

The incidence and severity of foliar diseases came as a surprise: it's much higher than we expected and until the last three years was pretty much ignored. Five years ago I had never heard of septoria, tan spot, spot blotch, net blotch, etc. Now I wish I'd never heard of them.

Current research shows little yield loss due to these diseases but most of

that work is done under rainfed conditions. Fungicide work, even under irrigation, has not been too encouraging. My own observations indicate that diseases don't become severe until well after the normal dates of fungicide application. The yield losses from disease are felt to be low with late infections but if it's not disease causing some of the low yields experienced in the last two years, what is it? Soft wheat yields in both 1986 and 1987 were often below hard wheat or durum yields; in fact, I'd say they averaged below hard wheat and durum. Why? Fertility? Irrigation? Weather? Disease? While our MEY work has helped increase production, it has also increased our questions and made us more aware of areas where we lack up-to-date research information.

Previous to that program we simply responded to farmer inquiries. The interactive program gave us a much better opportunity to observe and discuss the result of a given change in management. We were also able to tailor our extension effort to the current knowledge or management level of the individual grower which varied from "what do the numbers on a fertilizer bag mean?" to "if I put the second fertilizer application on at Zadocks 14-22 how will that affect lodging?"

The point here is that MEY on my farm will not be the same as MEY on your farm and that the management or the factors required to optimize yield will vary from field to field.

A second program investigating ICM techniques was run concurrently. It involved two sub-projects 1. field demonstrations and, 2. information collection and extension. Both were conducted with the active participation of local farmers and agri-business, chemical and fertilizer companies.

The field demonstration began in 1983 when, with the cooperation of Union Carbide, three 8-hectare plots of barley (one at Outlook, Hanley and Prince Albert) were sprayed with the plant growth regulator 'Cerone' (ethephon). The application definitely shortened the straw and reduced lodging but it did not increase yield.

We found that our knowledge base was not sufficient to run large acreage field demonstrations successfully at that time so we directed our energy to convincing researchers, public and private, to do some small plot work under

irrigation. That approach has been quite successful in that the amount of research under irrigated conditions has increased considerably in the past three or four years.

We generally assume that test plots outyield farmers fields by a 20 to 30 percent margin. In fact one complaint that I've often heard from farmers is that test plots don't accurately reflect farm reality, that they yield too high. I no longer subscribe to that theory, in fact I think the researchers are going to have to sharpen up their production techniques if they expect to keep up to the farmers. In the past few years it hasn't been too difficult to find field yields equal to or exceeding small plot research yields. This situation prompts me to ask, "Are the top farmers using more advanced production techniques than the researchers?"

With this situation in mind we have directed our attention more toward the progressive, innovative farmer. I don't mean to imply that we are ignoring the researchers because they are still the major source of new information, but the question of how best to use that information is often answered by the top management farmer and as an extension agrologist how to

make use of information is as important as the facts.

I was not trained as a cereal agronomist, nor were any of my colleagues in the Irrigation Branch, so one of the first things I learned when we started this program was how little I knew about cereal production. As I began to learn a little more the second big surprise became apparent - "how little the cereal growers knew about cereal production ". Oh we both could recite the names of ten or fifteen varieties, knew the seeding rate for hard wheat and durum and barley, knew how deep to seed and a dozen other similar facts but we didn't know why. We didn't know the reasons behind the recommendations, we didn't know how the plant reacted to different inputs or conditions and we didn't know why they reacted that way.

The question we asked ourselves was, "how can you get the most out of a crop if you don't know the effect on that crop of the basic production inputs"? The answer we came up with was "you can't", therefore we set out to improve both our and the farmer's knowledge of basic agronomics, the physical and chemical changes in a plant due to environmental changes and the growth and development of the plant.

To date two publications, "Irrigation of Cereal Crops" and "Yield Component Measurement As a Cereal Production Technique", one slide set "Irrigation of Cereal Crops" and three video tapes, "Plan to Pump", "Know Your Soil", and "Turning Off The Tap" have been produced to help us in this work. These are available from the Outlook office of Sask Water.

Also on the information collection and extension side, we organized a series of meetings beginning in the winter of 1982-83 with the theme of 'Wheat Highs and Irrigation Management' (WHIM). These meetings were more than just a passing thought, however. The objective was to bring together a group of top irrigation farmers and a guest speaker on some aspect of irrigated wheat production and to encourage a frank open discussion on the material the speaker presented. These meetings were not publicly advertised, they were by invitation only. We selected about sixty farmers, province-wide, who we felt would contribute to the discussion and either called at their farm or phoned to invite them to the initial meeting. Subsequent meeting notices were by mail. These were day-long meetings with dinner brought to the hall and the farmers paying \$5 to \$10 apiece for the meal and speaker expenses.

I have to admit that's one of the sneakier tricks we've used to get to hear out-of-province speakers.

The WHIM series carried on for two winters and six meetings. There were a number of public meetings both during those two years and since that followed a similar format. For example, we had two ICM meetings with several guest speakers, one in Saskatoon and one in Outlook. Both meetings drew irrigation and dryland farmers from well outside the immediate area, indicating the widespread interest in this relatively controversial subject.

The latest step in our cereal production program is a close association with an Irrigation Crop Production Club at Outlook. This club consists of ten of the top producers in the Outlook area that got together with the encouragement and financial support of the BASF Corporation and are helping each other improve the profitability of their farms. We are assisting them in planning their production programs, in monitoring those programs and in analysing the results. The information gained from our association with these growers will be extended to other irrigation farmers.

The Outlook club is trying to arrive at maximum economic yields by firstly determining the most efficient use of current technology, and secondly, by the investigation of new technology.

To achieve the first objective the group has chosen two paths, 1. increased education via group meetings, guest speakers and information collection, and 2. detailed record keeping - not just financial records because they already have those, but detailed production records.

To achieve the second objective the group tries to increase their information base but has also initiated a series of 'high input' demonstration fields that use increased fertilizer application, plant growth regulators, fungicides, and increased irrigation. These fields are twenty to thirty acres in size to remove any small plot effects and are as much as twenty miles apart to reduce the risk of storm damage, etc.

In summary, we have been assigned the tasks of smoothing the transition between dryland production and irrigated production and increasing the yields

and production economics of irrigated crops. The extension program we developed to complete these tasks is based on frequent one to one on-farm consultations with interested producers. The results of any extension program are difficult to measure and one of the mistakes that we made was not including any objective means of evaluating the program. I would recommend to anyone in the extension area to identify the current level of management, production or whatever, and to set a goal level which you strive to reach. The 'grow with canola' program is by far the best example I can think of to illustrate how it should be done.

Subjectively, we think the program has done very well. We have seen cereal yields in the last three years that exceeded any previous yields reported under irrigation in Saskatchewan and these were quite often by farmers that had taken part in our program. We have also seen average irrigated cereal yields rise.

Also subjectively, we feel the irrigators that have worked with us are more knowledgeable about production basics than they were five years ago, partly at least, as a result of our work.

Extension methods must change if we are to maintain a service to our clients and this project-oriented intensive approach is one change that appears to work. We must be able to respond to the needs or wants of our clients with appropriate changes in activities or methods. The research community must also respond to those pressures. In fact, maybe both groups should anticipate those needs. Why do we have to be put into an economic crisis before we look to Maximum Economic Yield production?

Saskatchewan agriculture is based on Saskatchewan research. As extension agrologists, private industry or government, we help move that research knowledge to the producer. We can be a two-way street. We can also be of help to the research scientist by providing that scientist with information on what research the producer needs or wants.

Thank you for the opportunity to present this information and I hope you will find it to be of some value.

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