the WATER HAULER'S BULLETIN

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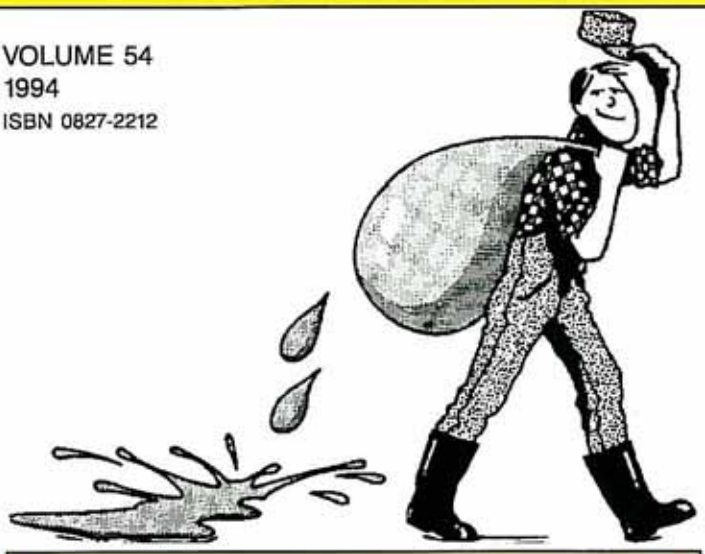

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IRRIGATION RESERVOIRS SUPPORT COMMERCIAL FISHERY

For most prairie people, when they hear the words "commercial fishing" one's mind immediately pictures large ocean going vessels heaving in the waves, long gill-nets being hauled in by men in yellow slickers and fish thrashing as they slide into the ship's hold. But for some prairie folk, especially those who live in or near irrigation impoundments, the brush paints a different picture. The men are still there, so are the fish and the nets, but add to the picture a frozen lake surface, ice augers, jiggers, four-wheel drive trucks and hundreds of plastic tubs. This is the picture of the commercial fishing industry on 12 to 15 irrigation reservoirs in southern Alberta.

Lake whitefish are the mainstay of the commercial fishery. Many larger reservoirs were planted with whitefish eggs in the 1940s and 50s by the Alberta Government. Whitefish have since spread to nearly all the reservoirs in the canal systems. The annual catch from the irrigation reservoirs is between 190,000 and 360,000 kg. Most of the fish caught commercially are peddled fresh to a waiting local market. Individuals buying whitefish pay approximately $1.75/kg for whole ungutted fish or $3.00/kg for gutted. Commercial fishermen cannot sell their catch directly to stores but must

Commercial fisherman Len Steinbrenner removes whitefish from net while conservation officer Terry Mack looks on.

market fish for retail purposes through the Freshwater Marketing Corporation in Winnipeg.

Whitefish are caught in gill nets. With the aid of an apparatus called a "jigger" the 100-m long nets are strung and set beneath the ice. The size of the mesh is specified (112-137 mm) by the fisheries division of Alberta Environmental Protection so that only the large mature fish are caught. Commercially caught fish are sold in categories: "jumbo" (2 kg and over), "large" (1.3-1.8 kg) and "medium" (0.7-1.3 kg).

To protect the fishery stock in a reservoir a harvest quota is established based on productivity for both whitefish and fish considered to be sports fish. "For example," says Frank Bishop, regional fisheries biologist with the department, "the Little Bow Reservoir has a maximum whitefish annual quota of 13,600 kg. When this quota is reached, after a day or two of fishing, the season is closed. We have established very low maximum limits for pike and walleye in all reservoirs and if the commercial fishermen catch that limit before reaching their whitefish quota the lake is closed." Further protection is provided in some lakes by closing areas to netting where sportsfish are known to be concentrated in a particular area.

For many commercial fishermen in southern Alberta the occupation is a second one. Many are farmers or have seasonal jobs that allow them to fish throughout the winter to supplement their income. One such person is Raymond Irrigation District farmer Heinz Plontke who, in periods of low farm activity, supplements his income by commercial fishing. "I cannot make much money because of the limited licenses available but it all helps," says Plontke. Only a limited number of licenses have been granted states Bishop, and no more are being issued because we have enough fishermen. Anyone wishing to start commercial fishing must obtain one from a current license holder who is willing to give it up. Usually this means buying the license says Bishop.

Without irrigation reservoirs, there would be no commercial fishery in southern Alberta for approximately 117 licensed fishermen, nor would the consumer be able to enjoy the fine flavour of fresh whitefish from cold clear irrigation water. No better attestation can be given than to repeat the quotation of J. Richardson (1836) after his quest for the polar sea. "Although we cannot verify that one can eat it for months without tiring, we can say from personal experience that a diet of whitefish alone, with no other food, can be eaten for days.

For more information please contact Frank Bishop, Regional Fisheries Biologist, Alberta Environmental Protection, 530 - 8 Street South, Lethbridge, Alberta, Canada T1J 2J8. Telephone (403) 381-5281. ■

SOLAR PANEL PROTECTION

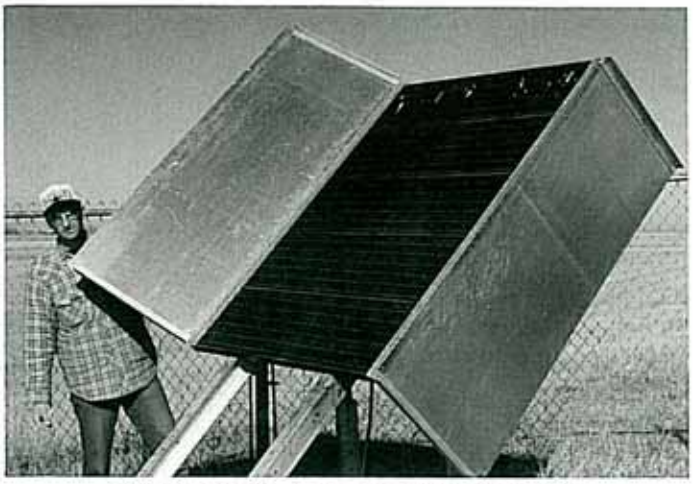
The Lethbridge Northern Irrigation District's operations and maintenance manager, Kevin Morris, needed some type of protection for solar panels when they are inactive at remote self-cleaning screening sites. The panels are inactive over a long period of time from the end of October until spring start-up in mid May. It only makes good sense says Morris, to protect the expensive panels from birds, vandalism and the elements.

Morris originally thought of having the shields made from steel plate but that idea was soon abandoned. Instead he opted for aluminum. Although aluminum does not provide protection from penetration of high caliber rifle bullets it does have advantages. The shields are light enough for one man to flip the covers in place. Unlike steel, aluminum needs no painting or other special protective coatings to prevent rust.

The covers are fabricated and welded in our own shop by Bill Richardson from 10 gauge aluminum sheeting, says Morris. We attach the covers by bolting the aluminum L frame to the metal solar panel frame. Full-length stainless steel piano hinges allow the covers a 270 degree rotation.

"Since the covers can be opened and closed just about as easily as a cupboard door, our water supervisors close them in the evenings if a hail storm seems to be building. When we decided to build them, we didn't really think of this type of temporary protection," concludes Morris.

For more information please contact Kevin Morris, Operations and Maintenance Manager, Lethbridge Northern Irrigation District, 334 - 13 Street North, Lethbridge Alberta, Canada T1H 2R8. Telephone (403) 327-3302. ■



Kevin Morris flips back covers from solar panel.

ALBERTA AGRICULTURE, FOOD AND RURAL DEVELOPMENT BUSINESS PLAN

Key Program and Policy Changes

The Ministry has released its business plan which covers the next three years. It has been prepared as part of the Province's effort to reduce expenditures, target activities to create jobs and growth and to increase the responsibility citizens have for their own well-being.

The Ministry's mission is to ensure the existence of policies and services which support the sustainable growth and development of a market driven agriculture and food industry.

Key changes in the business plan include:

- increasing research within the industry
- refocus resources to increase the availability of specialists
- charge clients for information and services
- develop an electronic communication's network
- reduce farm input cost subsidies
- reduce public investment and increase user contributions in irrigation rehabilitation
- develop a longer-term approach to irrigation funding
- move to full cost recovery for provincial grazing reserves
- increase efforts to achieve a policy and economic framework which provide improved access to domestic and international markets and encourages competitiveness

Of interest to the readers of the Water Hauler's Bulletin, says Doug Radke, deputy minister, Alberta Agriculture, Food and Rural Development, will be the changes in the irrigation programming. As you may know, the mandate for the Irrigation Rehabilitation and Expansion Program, which is funded by the Alberta Heritage Savings Trust Fund, expires in March 1996.

In recognition of the significant contribution that the irrigation district infrastructure makes to the province, the business plan provides for funding to be sustained into the future with funds from the General Revenue Fund, states Radke.

Relative to expenditures in 1992/93, the business plan provides for a 14% reduction in the level of provincial funding being provided to the irrigation districts for infrastructure rehabilitation under the Irrigation Rehabilitation and Expansion Program. It also provides for a change in the cost sharing formula which will increase the irrigation district contribution from 14% to 25%.

These changes are to be phased in over the next two years to give those affected time to adjust in their operations. On average it is estimated that these changes will increase water user rates by $1.15 per acre in 1994 and by an additional $1.00 per acre in 1996.

Given the commitment to provide ongoing funding to support the rehabilitation of the irrigation infrastructure, the rationale for the Irrigation District Rehabilitation Endowment Fund no longer exists. No further contributions will be made to the Fund and the assets are to be disbursed after consultation with the irrigation districts.

A subcommittee of the Standing Policy Committee of Agriculture and Rural Development has been struck to seek input from the irrigation community and to advise the government on the design of a long-term program to sustain the irrigation infrastructure. The task force will also be providing recommendations on the dispersion of the assets of the Endowment Fund and the provincial water user fee proposed by Alberta Environmental Protection.

Changes have also been made to the Alberta Private Irrigation Development Assistance Program. The budget for this program has been cut by 50% in 1994 and the per acre maximums on the assistance have been cut by one third to $100 per acre.

The second and final phase of the privatization of the land classification program will be made in 1994. The department will no longer be competing with the private sector in the provision of this service.

The last change in our irrigation programming that has been included in the business plan is the move to begin charging fees to clients using the services of the irrigation branch. Beginning April 1994, fees will be assessed for the following services:

- land levelling design
- drainage design
- agricultural feasibility report preparation
- irrigation systems evaluation
- irrigation management training

In conclusion, states Radke, the business plan focuses the resources of the Ministry on establishing partnerships with the industry to assist it to become more self reliant and competitive. These changes have been undertaken in consultation with the industry through the Creating Tomorrow process and the business plan consultations. ■

IREP FUNDING OF ON-FARM GRID DRAINAGE REVISITED

The Irrigation Rehabilitation and Expansion Program (IREP) was introduced in 1969 to provide funding for the upgrading of irrigation canals. Funds are used to improve conveyance efficiency, increase the life span of irrigation canals, and control canal seepage so land lost to seepage might be reclaimed.

One instance of IREP funds being used for canal seepage control occurred in 1988 and 1989 when part of the Monarch Branch Canal in the Lethbridge Northern Irrigation District (LNID) was rehabilitated using on-farm subsurface drainage. On-farm drainage was used over more conventional alternatives, such as full canal liners and deep interceptor drains, because of lower cost. As well, on-farm drainage was considered to be more effective in controlling salinity and waterlogging, which was caused by both canal seepage and natural groundwater discharge. On-farm drainage also provides the opportunity for reclamation of the salinized land and for the farmer to possibly add adjacent works for further improvement.

Design work was undertaken jointly by the LNID and the land evaluation and reclamation branch of Alberta Agriculture, Food and Rural Development. The project was constructed over two years and was completed in the fall of 1989. About 800 acres of land was drained by plowing in 148 km of corrugated polyethylene drain tubing which ranged in diameter from 100 to 200 mm. The project also included open excavation to install eight manholes at legal boundaries, five road crossings, eight gravity outlets and one pump outlet. Funding was provided through the IREP program at a cost of about $605/acre.

The use of on-farm drainage for controlling seepage is unusual because works constructed under the IREP program are usually on district-controlled land and thus are owned and maintained by the irrigation district. In this case the farmers maintain ownership of the drainage systems, not the LNID, because the drainage was not constructed on district-controlled land. The LNID, however, maintains responsibility for manholes, road crossings and pump stations.

Following construction of the drainage systems, a soil sampling program was undertaken by the land evaluation and reclamation branch, the LNID and several landowners to determine if irrigation was leaching salts from the root

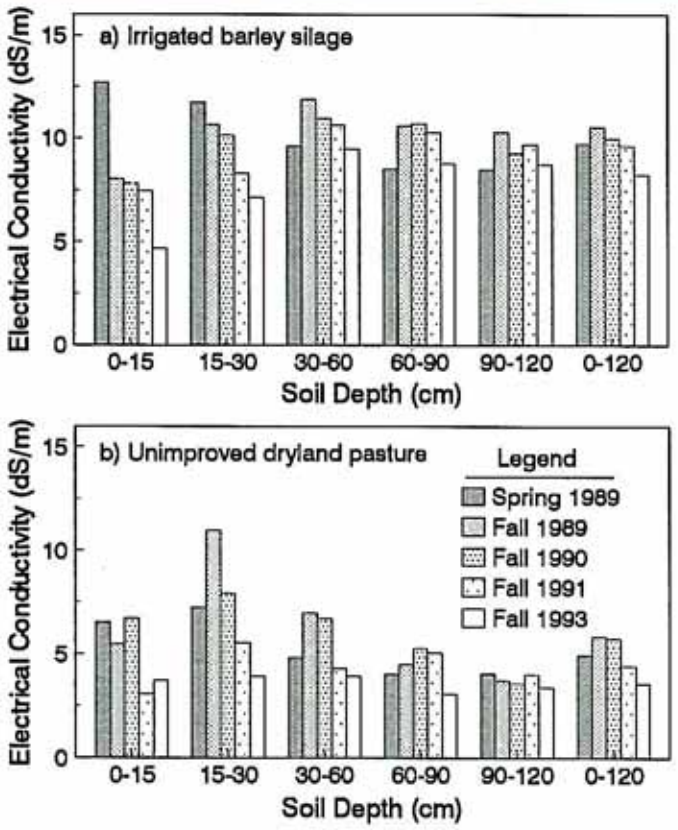


Figure 1

zone to reclaim the soil. Some of the drained parcels were not irrigated and these were also sampled for comparison.

Changes in soil salinity levels, measured as electrical conductivity, were determined for several drained areas between 1989 and 1993. Representative results from two sites, which were drained in the fall of 1988, are shown in Figure 1. Reductions in soil salinity were generally highest on the irrigated land in the upper part of the soil in the first few years. There was little change in soil salinity at depth. Rainfall was high between the samplings done in 1991 and 1993. This caused a substantial reduction in salinity at both irrigated and dryland sites, but again most of the reduction in salt levels was restricted to the upper soil. After five years salts in the upper 15 cm of soil had been reduced by about 7.6 tonnes/ha (65%) on the irrigated land and by about 2.6 tonnes/ha (45%) on the dryland. Overall there was only a small amount of salt removed from the crop root zone (0-120 cm): 11.4 tonnes/ha (17%) on the irrigated land and 9.9 tonnes/ha (30%) on the dryland.

According to Gary Buckland of the land evaluation and reclamation branch, "it was somewhat surprising to see similar salt removal from both the irrigated and dryland parcels, since the irrigated land received about twice as much water as the dryland. This could reflect both the high rainfall during 1993 and the deeper water table which was generally present at the dryland location compared to the

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BUYING A DATALOGGER

The decision has been made, you want to use electronic dataloggers to record your data. To help make a "smart decision" on which make and model to purchase, the potential buyer should work through the following 13 questions, says Brian Cook, an electronics technologist with the irrigation branch, Alberta Agriculture, Food and Rural Development.

1. Accuracy? Most dataloggers built today operate in either single precision mode (data is stored in one byte with a resolution of one in 256) or double precision (two bytes are used to store data with a resolution of one in approximately 64,000). Double precision reduces the memory by 50%. Beware of terminology such as "Up to Specs" which means it is possible, but only under lab conditions; "Typical Specs" indicate what you could obtain in the field.
2. Number of dataloggers needed? Sites within 50 m of the logger may be added until all the channels on the logger are filled, otherwise one logger per site will be needed.
3. What time interval should I use? Most loggers are only able to record at one timed interval, therefore the most rapidly changing events will determine the recording interval.
4. How often will I collect data? Nearby sites may be visited once a week to collect data. You could visit more remote sites only once or twice a year.
5. How much memory does my datalogger need? This depends on how often you are recording events, says Cook, how many channels are used, single or double precision and how often your crew can visit the loggers and download data. Memory size means very little. The actual number of data points which can be recorded is far more important.
6. How long will the datalogger's batteries last and are they supplied with the unit? Many dataloggers are supplied with batteries that will last at least six months — larger, longer life batteries can be purchased.
7. What additional equipment do I need? Most loggers require some form of data terminal, laptop computer, or memory module to transfer data to a desktop computer.
8. Is there backup memory storage if the main battery fails? Some manufacturers have no memory backup system, some store the data in removable memory modules with their own internal batteries, others have five-year internal memory batteries to save data.
9. How will I handle the data I collect? Some events such as rainfall can be presented as a daily total and require only a few minutes with a pen and paper, other events require a large spreadsheet.
10. What staff do I need to operate my loggers? A two-man crew may handle 20 to 40 dataloggers each irrigation season. One technologist working a half to a full day per week could probably operate one or two loggers.
11. What staff training is required? As dataloggers are a type of computer and record data in a digital form, the technologists operating them must be computer literate. Some dataloggers are user friendly and only require a couple of days' training, others require several weeks intensive training.
12. What else can I record? Most dataloggers can record data on two to 24 channels from three different types of inputs: analog, stobe, and status. Several useful operating modes include timed, strobe, tracking window and recording only minimum/maximum and average readings.
13. Temperature Specs? To log irrigation flows, it is important to be sure that your logger and probes work accurately in a range from just below freezing to +40°C.

Now that we have discussed the thirteen datalogger questions, it's time to talk about manufacturers' and dealers' support, both before and after the sale, says Cook. They should offer:

1. Staff training either as a part of the purchase price or as a separate contract.
2. Probe selection, most manufacturers carry a selection of standard probes which will work well with their equipment and can help you select and install any custom probes you may need.
3. A minimum of one year warranty on all parts and service.
4. Full parts and service centers located relatively nearby.
5. Hardware and software upgrade, find out what the manufacturer's policy is concerning supplying upgrades to hardware and software that may make your loggers more useful to you in the future.

One final word of advice, says Cook, either obtain a "loaner" or a rental unit and try it under your conditions before making that final purchase.

For more information contact Brian Cook, Electronics Technologist, Irrigation Branch, Alberta Agriculture, Food and Rural Development, Agriculture Centre, Lethbridge, Alberta, Canada T1J 4C7. Telephone (403) 381-5878.■

SNOW SURVEYS AND THEIR IMPORTANCE TO WATER MANAGEMENT IN SOUTHERN ALBERTA

The mountain snowpack and its rate of melt contribute largely to water management in the irrigation farming industry in southern Alberta. In the 1920s the Americans developed a means for measuring the water equivalent (W.E.) in snow called the Mt. Rose Snow Sampler (shown in use in picture). By making periodic measurements of W.E. in the snowpack during the accumulation period or near its end, a forecast of water availability could be made for the runoff period.

In the late 1930s the Canadian government began doing snow surveys in the Banff area at lower valley sites accessible by train and snowshoes. By the 1960s, with water management becoming a hot topic in southern Alberta, the need for a more extensive and higher elevation sampling program was evident. In 1967, Water Survey of Canada began sampling at several more sites in the headwaters of most major streams from Glacier Park in Montana to Jasper. This larger network only used roads or snowmobile access and failed to give proper coverage to the Oldman River Basin.

In 1978, says Dick Allison of the water survey section of Alberta Environmental Protection, Alberta Environment took over the existing snow surveys from the federal government and, with input from the River Forecast Centre and the Water Survey Section, built the **Snow Survey and Telemetry Network** that provides the data used today.

Technologist shown using the Mt. Rose Snow Sampler.

Allison says that "on a monthly basis, beginning at the end of January, crews from the water survey section go to the mountains to collect data. Skis, snowmobiles and helicopters are used to access up to 45 sites per month. The water supply available is known as early as the end of January. By assuming normal precipitation to the end of the runoff period, we can forecast the supply for better management of our precious resource. When the mountain runoff begins, we know how much water is in the snowpack. We can predict with good accuracy the rate of melt and total volume flows, depending on temperature and precipitation, until the snowpack is depleted. This information is very helpful to Trans-Alberta Utilities, Alberta Environmental Protection and irrigation companies as to how they operate their reservoirs and systems during the spring and summer months.

The April 1 snow surveys conducted last week (March 28-31) produced the following results:

Lower Oldman	65 to 75% of average
Upper Oldman	70 to 80% of average
Bow-Highwood	95 to 105% of average
Red Deer	110 to 120% of average

The water supply forecast for April has not been released yet, says Allison, but it will be based on the above results of the snow surveys.

Look for a report on the Alberta Environmental Protection Telemetry Network in an upcoming *Water Hauler's Bulletin.*

For further information or forecasts, please contact Dick Allison, Water Survey Section, Alberta Environmental Protection, Provincial Building, Lethbridge, Alberta, Canada T1J 4C7. Telephone (403) 381-5579. ■

A DATE TO SET ASIDE

The Annual Technical Conference for irrigation district management and engineering staff will be held on June 3, 1994 at Ericksen's Family Restaurant. The Alberta Irrigation Projects Association and Alberta Agriculture, Food and Rural Development are cosponsors. Persons wanting to make a presentation should contact J. Ganesh, P. Eng. at telephone 381-5869. ■

NEW ALBERTA PESTICIDE REGULATIONS

On September 1, 1993, the *Alberta Environmental Protection and Enhancement Act,* or AEPEA, became law. AEPEA takes the nine separate acts which previously dealt with the environment and combines them into one comprehensive piece of legislation. The new legislation not only updates laws which were first introduced over 20 years ago, it also simplifies and clarifies the environmental rules that industry and individuals must follow.

One of the nine acts AEPEA replaces is the *Agricultural Chemicals Act.* Now pesticides, and individuals who use pesticides, are governed by AEPEA and two new regulations — the **Pesticide Sales, Handling, Use and Application Regulation** and the **Pesticide (Ministerial) Regulation.**

In the past, says Robert Burland of the pesticide management branch, the *Agricultural Chemicals Act* regulated pesticide use under a system of licences and permits. The new legislation will use a system of approvals, certificates of qualification, and legislated procedures. Some of the changes that are relevant to pesticide use by irrigation districts are discussed here.

1. Pesticide Service Approvals

Irrigation districts will now be required to obtain a Service Approval in order to use pesticides. Service Approvals are required by anyone who uses pesticides as follows:

- for hire or reward (e.g. spray companies);
- on a right of way;
- on a park, boulevard, campground or picnic area located on public land; and
- for forest management.

"Right of way" and "public land" are both defined by the pesticide regulations. "Right of way" includes land used for irrigation and drainage canals. "Public land" includes land owned by an irrigation district.

A Service Approval can be issued for up to five years. It outlines the conditions under which a service will use pesticides. The Service Approval holder will be responsible for:

- the certified applicators who will do the work under the Service Approval;
- the pesticides used;
- pesticide applications, procedures and equipment; and
- mixing, loading, and storage procedures.

The Service Approval holder must maintain liability coverage in accordance with annual requirements (comprehensive liability as well as drift damage liability).

Pesticide application businesses who have previously licensed pesticide applicators will be contacted by the pesticide management branch during a phase-in schedule of the new Service Approval system. Any new businesses that begin pesticide application services after September 1, 1993, should contact the pesticide management branch concerning details for obtaining a Service Approval.

Some services will be required to notify the public before an approval is issued. Details as to the process and form of public notification will be provided during the application process, states Burland.

2. Pesticide Special Use Approvals

Special Use Approvals are now required for applying pesticides to or within 30 metres of open bodies of water (i.e. irrigation canals). The requirements are not significantly different than under the previous legislation. However, approval holders must now follow a formal public notification process aimed at who may be directly affected by the proposed pesticide application.

A Pesticide Service Approval may also authorize pesticide use to or near open bodies of water. This eliminates the need for two approvals if a Service Approval is also required by the applicant.

Another legislated change is that pesticide applications by ground equipment on cultivated land can now be made up to 10 horizontal metres from an open body of water without a Special Use Approval.

3. Certificates of Qualification

Pesticide Applicator Licences issued under the former legislation are now being changed to Pesticide Applicator Certificates. Each individual applicator will be issued a new certificate indicating the appropriate applicator class.

Applicator certificates will be valid for up to five years (instead of the previous three). Applicator classes are no longer referred to as alphabetical letters; an irrigation district applicator licence, for example, will now be called an Aquatic/Industrial Class Certificate.

Individuals will no longer be required to obtain a medical examination in order to qualify for a Pesticide Applicator Certificate. The requirement for the Service Approval holder to provide proof of insurance means that individual certified applicators will not need to meet this requirement.

4. Pesticide Scheduling

The scheduling system for pesticides has been changed from six to four schedules. Schedule 1 and 2 products are those that are labelled restricted or commercial and contain all of the herbicides that an irrigation district might use for vegetation control. Schedule 3 and 4 pesticides are domestic products available for use by homeowners.

Among the products used by irrigation districts, acrolein (Magnacide H) is the only product in Schedule 1. Products that are used on canal banks and contain 2,4-D, dicamba or glyphosate are included in Schedule 2.

Schedule 1 and 2 pesticides can only be purchased by:
- a commercial agriculturalist;
- a certified applicator;
- a conditional certified applicator; and
- a Service Approval holder.

Acrolein (a Schedule 1 pesticide) can only be applied by a certified applicator, states Burland.

Schedule 2 pesticides can only be applied by:
- a commercial agriculturalist;
- a certified applicator;
- a conditional certified applicator; and
- persons under the supervision of a certified applicator.

This discussion has touched on some of the major pesticide regulation changes in Alberta relevant to pesticide use by irrigation districts. The public is invited to obtain copies of the *Alberta Environmental Protection and Enhancement Act* and the two pesticide regulations from Publications Services, Main Floor, McDougall Centre, 455 6 Street S.W., Calgary, Alberta, Canada T2P 4E8. Telephone (403) 297-6215.

Copies of the regulatory procedures can be obtained from Pesticide Management Branch, Rm. 2:45, 200 - 5 Avenue S., Lethbridge, Alberta, Canada T1J 4C7.

Additional information can be obtained by contacting Robert Burland of the Pesticide Management Branch, Lethbridge at (403) 381-5511.■

ON-FARM GRID DRAINAGE REVISITED
(continued from page 4)

irrigated location." A deeper water table would reduce the upward movement of water and dissolved salts during dry periods and enhance leaching of salts during wet periods.

Perhaps the similarity in salt removal between the irrigated and dryland parcels reveals a need for more emphasis on irrigation management. Often there is a false sense of security that drainage in itself will cause soil reclamation. With drainage there will be some capillary rise of water and salts from the water table will continue to salinize the soil, although at a slower rate than without drainage. This is illustrated in Figure 1 where soil salinity increased in the crop root zone in some years even though salinity was reduced in the surface soil. Rainfall and irrigation in excess of crop requirements must take place to flush accumulated soil salts through the soil and into the drains. This is critical if soil reclamation is to be achieved.

For more information contact Gary Buckland of the Land Evaluation and Reclamation Branch, Alberta Agriculture, Food and Rural Development, Agriculture Centre, Lethbridge, Alberta, Canada T1J 4C7. Telephone (403) 381-5882.■

THE WATER HAULER'S BULLETIN

Designed to provide the operation and management personnel of Irrigation Districts with items of interest in their line of work. Comments are welcome. Please contact Duncan Lloyd, editor, at Area Code (403) 381-5539, Lethbridge.

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AGRICULTURE
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