Salinity-1/31/06
Workshop

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JAN 2006
SWRCB
Executive Off.

1/18/06

Alternatives for salinity control in irrigated agriculture

Revised

My name is Vashek Cervinka. As an Agricultural Engineer I am working with the Westside RCD. For over 20 years I have been involved in the practical development and implementation of salinity control methods on farms in the San Joaquin Valley.

In my presentation I will address these three issues:

1. Salt management
2. Market-based future of economically and environmentally sustainable farms in the San Joaquin Valley
3. Contradictions of regulatory policies

Salt management

Salinity control in soils and groundwater must be viewed as an issue of salt management rather than as of water management. Some proposed solutions to salinity problems are suggesting to discharge drainage water into evaporation ponds. These concepts neglect the fact that a large mass of salt would be accumulated as a challenge to be addressed by future generations. We have to develop salinity control methods that would be economically and environmentally appropriate for the next 200 years and beyond. Two possible methods of managing the salt are to discharge the salt into the ocean or to develop markets for salt harvested on farms.

We are learning that drainage water can be a valuable resource for the irrigation of salt tolerant crops and trees. The salt could be discharged in a highly concentrated drainage water of at least EC 30 when it is not suitable for irrigating crops. This salinity level would be similar to the salt concentration in ocean water. If we consider only one (1) cubic mile of ocean, its water contains about 124 million m.t. of salt. Discharging 1 million tons of the salt from the SJV would increase the salt mass to 125 million m.t.; it means by 0.8 percent. The salt concentration in ocean water would increase from about EC 33 dS/m to about 33.3 dS/m. It would be negligible, and the discharged drainage water from the SJV could not obviously be constrained to only one (1) cubic mile. However, any discharge of salt to the ocean would involve costs for the construction and operation of discharge facilities as well as energy costs. Who would pay for the discharge of the salt in the ocean? Considering the status of government finances, could

growers afford to pay for discharging salt in the ocean at this time, for the next 200 years and beyond?

Salt is the product of a potential economic value. It could be wasteful to discharge it into the ocean. Some salt, such as gypsum, can be directly reused on farms. The market for other salt products exists. Can we develop it in a competitive way on farms? Can we develop new salt products? It is a promising concept. The state government has been initially funding some R&D activities in this area. We need to seriously address this opportunity. The marketability of the salt harvested on farms would require a well coordinated R&D effort.

Both methods of salt management, either discharging it in the ocean or using it as marketable product, would benefit from the coordination between the agriculture and industry. Both sectors are facing the similar salt problem.

Market-based future of economically and environmentally sustainable farms in the San Joaquin Valley

Historically, the federal government has played a leading role in the development of drainage operations in the SJV. This effort has not always been successful. The government funds may sometimes provide wrong signals for the R&D effort and government policies may not be respectful of growers' needs. Rather, market-based drainage management could be considered.

The following two examples indicate that such drainage management is possible. Example #1. A grower did not want to retire his low productive land. He has developed a drainage management system on his farm. He reclaimed the land that is now producing high-value salt sensitive crops (vegetables). He is using the drainage water to produce salt-sensitive crops, incl. canola. He is processing this canola into vegetable oil, bio-diesel and high-protein (selenium-enriched) feed. The salt tolerant grasses are used as a pasture for livestock, adding a higher value to these crops. He is also investigating fish farming in highly saline brine. In the cooperation with the Department of Water Resources this grower is developing utilization methods for harvested salt. He is managing salt and selenium on his farm. Example #2. A grower operated an evaporation pond. The costs of regulatory requirements were very high, and, therefore, this grower considered retiring his land. However, after learning about on-farm drainage management, he developed this system on his farm. He had to pay for the permitting documentation, but the monitoring costs for the evaporation ponds were eliminated. This grower is expanding his operation and has been producing high-value crops (vegetables) for domestic and exports markets.

Both growers will be able to farm in a sustainable way for years to come. Their operation makes good economic and environmental sense.

Some world regions use an economic concept of emission trading to improve air quality. This opportunity should be evaluated for providing economic incentives to plant trees and grasses on farms in the SJV.

Contradictions of regulatory policies

The objective of the State regulatory policies is to protect the quality of water, both surface water and groundwater. This is a very important environmental concern. The basic contradictions of these policies are that they selectively impose regulations on the farmers who are protecting the quality of groundwater and soils by developing sustainable, environmentally sound farming methods. If these growers would not try to farm in a sustainable and ecologically sound way, they would not be regulated. As a result, the administrative requirements and costs of regulatory procedures are effectively discouraging farmers to operate in a way that would be environmentally beneficial to the quality of our state water resources.

Conclusions

Be serious about salt management. Discharge it in the form of concentrated brine into the ocean, and/or support the development of the utilization of farm and industry based salt. Do not leave this challenge for future generations.

Try to solve drainage problems by supporting market-based actions and less by government subsidies.

Rather than regulate, provide support and incentives for those growers who are managing salt and selenium on their farms without disposing any drainage water into our state water resources.

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