



**West Central Airshed Society**  
P.O. Box 7421, Drayton Valley, Alberta T7A 1S6

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## **Agriculture Meeting Notes**

### **March 17, 2004**

9:00 a.m. to 12:00 p.m.

Main Conference Room  
Penn West Building, 50<sup>th</sup> Avenue West  
Drayton Valley, AB

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#### In Attendance:

Cecil Andersen	Pembina Agriculture Protection Association
Steve Probert	Capital Health
John Whaley	Leduc County
Robert Raimondo	EPCOR
Rick Phaneuf	AENV
Greg Gabert	Penn West Petroleum Ltd.
Jim Bolton	TransAlta

#### Special Guests:

Dr. Allan Legge	Biosphere Solutions
Dr. Sagar Krupa	University of Minnesota
Elaine Ryl	Operations Contractor
Dave & Gloria Jouan	Landowners
Cliff & Audrey Whitelock	Landowners
Sylvia & Bill Flesher	Landowners
Harold & Yvonne Webber	Landowners
Jason Thompson	Western Review
Dick Puurveen	University of Alberta
Darcy Bryant	Public

#### WCAS:

Bob Scotten	Program Manager
Barb Johnson	Environmental Engineer

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## 1. Welcome and Introductions

Cecil Andersen called the meeting to order at 9:30 a.m. Committee members and special guests were welcomed. Introductions were made.

## 2. Special Presentation by Dr. Sagar Krupa

Dr. Krupa presented the final conclusions to the agriculture report "Crop Responses to Air Quality in the West Central Region of Alberta." The focus of this research report was to determine the impacts of air quality by observing the foliar injury responses of Saskatoon Serviceberry (*amelanchier alnifolia* Mutt.) and yield responses of Alfalfa (*Medicago sativa* L.).

Dr. Krupa began with a brief summary describing the methodology of the program. He spoke to the types of plant responses to adverse air quality and indicated that the Alfalfa and Saskatoon species were chosen for this project since the Saskatoon serviceberry was known to be a biological indicator of sulfur dioxide exposures and the yield responses of Alfalfa were known to be sensitive to sulfur dioxide, ozone and nitrogen deposition.

Dr. Krupa reported that a forecasting model was applied based on the air quality and meteorology to predict alfalfa yields to test the validity of the predictors (air quality and climate) used. It was discovered that the model predicted correctly 88% of the time as to which alfalfa yield would be low and which would be high compared to median values. Dr. Krupa indicated that the data collected from the Carrot Creek location introduced a skewing of the model results.

General conclusions indicated that

- (1) the air quality (ozone, sulfur dioxide, and oxides of nitrogen) in the West Central Region clearly had a role in influencing the yields of alfalfa
- (2) among the air quality variables, ozone was the most significant
- (3) depending on the year and the location, the influence of air quality in the West Central Region was no more or less significant than other variables such as disease, insect infestation, and crop-weed competition.

The presentation then concluded and Dr. Allan Legge and Dr. Krupa answered questions concerning various aspects of the program. Discussions followed that described soil chemistry variations at individual sites and the impact of this against crop productivity. It was noted that the Tomahawk location had optimal sulfur content and was therefore more susceptible to overload adversely affecting yield.

Finally, Dr. Krupa indicated that the final report would be available in the upcoming weeks. Cecil thanked special guests for attending and the landowners expressed their satisfaction with the WCAS agriculture program. A brief recess break followed and the agriculture committee meeting resumed at 11:00 a.m.

## 3. Approval of the December 4, 2002 Draft Meeting Notes

Meeting notes of December 4, 2002 were approved by consensus.

## 4. General Discussion

Discussions concerning the 2004 agriculture program began. Several issues were discussed and it was then decided that a number of questions would need to be answered in order to determine how to proceed with the future agriculture program.

Bob agreed to contact Dr. Krupa to ask the following:

1. What parameters would need to be monitored at another station in order to use the model again?
2. Could data collected from the Breton location be used as a substitute for the Carrot Creek data that had been used in the agriculture model?
3. Could the agriculture program be reduced to two harvests? One harvest mid way and one at the end of the growing season?
4. In the future, would Dr. Krupa be interested in providing consulting services to the WCAS?

Next, Mr. Dick Puurveen of the University of Alberta reported that opportunities to engage a joint agriculture project with the University could be possible. Mr. Puurveen indicated that the University has been involved with agriculture plots in the Breton area for several years and that data has been collected from these sites. Further discussions indicated that Board Members felt that it would be important to continue to work with Dr. Krupa in a consulting capacity. However, it was further noted that Members felt it would be desirable to have the program carried out by utilizing local expertise and resources.

Finally, Elaine Ryl, agriculture operations manager, circulated a document outlining a streamlined bio-monitoring program that had been reviewed and agreed upon by Dr. Legge and Dr. Krupa. (*Attachment A*). Board members supported the document and Elaine agreed that there might be other ways to minimize costs as will be answered in Dr. Krupa's response to the questions above. Elaine also sought advice concerning the analytical component of the program. Elaine indicated she had received quotes concerning various analytic packages offered by Norwest Labs. The Board agreed to go ahead with a basic minimum package since samples could be kept for a long duration, at which time further analysis could be performed if necessary.

5. The meeting adjourned at 12:20 p.m.

MAY 2003

WEST CENTRAL AIRSHED SOCIETY

Streamlined Alfalfa Biomass Harvesting Protocol

After review and discussions regarding the options for streamlining the alfalfa biomass sampling protocol the following would appear to have general consensus.

Alfalfa growth will continue to be monitored over a 120 day growing season at three sites, Violet Grove, Tomahawk and Carrot Creek.

The Breton and Alder Flats sites kept in maintenance mode for observation.

Intermediate non-destructive growth measurements; alfalfa height and stem counts, will be carried out at 10 day intervals as was done in previous years. Heights taken from ground level and stems at counted at 6 cm height.

Final biomass measurements (dry weights of alfalfa and weeds separately) will be collected at the end of each 60 day harvest period.

There will be 6 replicate data points for all measurements taken at the 10 day intervals for each subplot.

Minimizing weed growth will be a priority since height growth of alfalfa assumes a monoculture.

Alfalfa subplots will be monitored for three seasons with Year One beginning in the year following the seed-down year. This will result in a six year rotation with, 3 subplots being actively monitored each year at each of the three sites.

For the 2003 season this would be Violet Grove 2000, 2001 & 2002, Tomahawk 1999, 2000, & 2002, and Carrot Creek 2000, 2001, & 2002. (The Tomahawk 2001 seeding did not establish due to dry conditions.)

The total of nine subplots, each with 2 harvests per year, would provide a total of 18 possible data points per year.

Reduction in destructive sampling will reduce plant loss and weed encroachment allowing for reduced subplot size requirements. To maintain the flexibility to return to past procedures if required, all subplots will be maintained at a minimum of 6 meters by 18 meters.

The minimum ½ meter buffer requires 22 sq. m., and the annual sampling area requirement is 18 sq. m. or 54 sq. m. over the three year period, therefore the absolute minimum area would be 76 sq. m.. A plot size of 6 X 18 meters provides 108 sq. m. which would provide a 40% safety margin for mis-seeding, drowning out etc.