



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

Agriculture Meeting Notes

Monday, December 2, 2002

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

Main Conference Room
Penn West Building, 50th Avenue West
Drayton Valley, AB

In Attendance:

| | |
|---------------------|--|
| Cecil Andersen | Pembina Agriculture Protection Association |
| John Whaley | Leduc County |
| Robert Raimondo | EPCOR |
| Rick Phaneuf | AENV |
| Greg Gabert | Penn West Petroleum Ltd. |
| Larry Paslawski | AEUB |
| Hercules Georgiadis | Weldwood of Canada Ltd. |
| Jim Bolton | TransAlta |
| Mary Griffiths | Pembina Institute of Appropriate Development |

Special Guests:

| | |
|-----------------|-------------------------|
| Dr. Allan Legge | Biosphere Solutions |
| Dr. Sagar Krupa | University of Minnesota |
| Elaine Ryl | Operations Contractor |

WCAS Team:

| | |
|--------------|------------------------|
| Bob Scotten | Program Manager |
| Barb Johnson | Environmental Engineer |
| Greg Swain | Senior Technologist |

Absent with Regrets:

| | |
|---------------|------------------------------------|
| Victor Mah | Westview Regional Health Authority |
| Al Watson | Luscar Ltd. |
| Dwayne Kruger | LARGA |
| Mike Woods | Weyerhaeuser Canada Ltd. |

1. Welcome and Introductions:

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

2. Review of Agenda:

There were no additions or deletions to the Dec 2, 2002 agenda.

3. Review of 2002 Agriculture Program:

3.1 Alfalfa

Elaine provided members with an overview of the site status of each of the five alfalfa bio-plots. (see Attachment A). It was reported that the 2002 growing season began with a late cold spring, followed by a hot, dry and windy summer. The fall was both cool and wet. Overall, Elaine informed members that the Violet Grove, Tomahawk, and Carrot Creek had a good establishment of 2002 seedlings while the Breton and Alder Flat sites were found to have been more stress affected.

Elaine reported that there were thirteen bio-plots in the 2002 growing season and twenty-six harvests. (see Attachment B). Elaine indicated that all plots of 1997 & 1998 have been worked up for next year, and for consistency sake the same protocols have been met as in previous years.

3.2 Saskatoons

Dr. Allan Legge indicated three field site visits were carried out to all five bio-monitoring plots over the 2002-growing season. Dr. Legge reported that on his initial visit foliar injury potentially due to ozone was observed at the Tomahawk site. Selected Saskatoons were observed for occurrence and development of this injury throughout the summer and a photographic record was documented.

Dr. Legge informed members that the Tomahawk site was found to be the most stressed, aphids and wasps were prevalent at this location. The fruit of Saskatoons at this site was also found to have a different taste than those tested at other sites. Dr. Legge explained that when stress is encountered in a fruit bearing plant the quality of the fruit could be affected.

An additional trip was carried out to Carrot Creek and Violet Grove to inspect foliar damage to the alfalfa plants noted by Elaine.

4. Agriculture Study Status

Dr. Sagar Krupa reported that at the end of year 2001 there was a total of sixty-eight harvests. Of these harvests, fifty-two complete data sets were obtained. Dr. Krupa informed members that the results of the 2002-growing season would bring this total to seventy complete sets. Dr. Krupa expressed his confidence that the sum of data sets would be sufficient to begin the generation of a final report which he indicated would be available by December 2003.

Discussions followed concerning the reported foliar injury assumed to be caused by ozone. Dr. Krupa explained that ozone was a product of variables such as temperature, humidity, solar radiation, vertical wind speed, and water availability. It was noted that analysis would be necessary to confirm that the observed foliar symptoms are indeed ozone exposure related.

Next questions were asked concerning the method in which to obtain yield data. The first option discussed was to utilize annual averages as publicized from Alberta Agriculture. It was noted that this information source references zone numbers that are not specific to the WCAS area of interest. It was recognized that the zones represents different locations to which there is much variability in such aspects as soil types. The second possibility considered was to simply use the WCAS data (intercept method) as recorded. The difficulty with using this data exclusively was that in years of poor yields, the construction of the model base would be greatly biased. After a lengthy discussion Dr. Krupa agreed to use both sources of information.

5. 2003 Agriculture Program

Elaine circulated a document outlining possible options for a streamlined bio-monitoring program beyond 2002. (*Attachment C*) Elaine's suggestions complimented those of Dr. Krupa's. His recommendations were as follows:

1. Identify and reduce the number of independent variables to the essential main factors, in future modeling. This would result in fewer situations of incomplete data sets.
2. Make better measurements of precipitation depth to coincide with the crop growth season (crop emergence to second harvest + minimum of one week before and after) or consider including soil moisture measurements.
3. Identify the alfalfa age class(s) or the year after seeding (year1, 2,3,or 4) that is most sensitive and only use it (them) in the future.
4. Use changes in LAI (Leaf Area Index) or height growth as a substitute for intermediate biomass measurements (to construct the growth curve).
5. Reduce the plot size, due to the use of non-destructive measurements of intermediate plant growth rates (#4).
6. Continue to maintain and observe the Saskatoon field plots for visible injury due to air pollution.

6. The meeting adjourned at 12:00 p.m.

Attachment A

October 2002 - Site Status - alfalfa

Violet Grove

- 2002 - good uniform establishment of alfalfa stand
- 2001 - fair to good uniformity of alfalfa plant population, areas of high clover populations
- 2000 - good uniformity of alfalfa through stand
- 1999 - good uniformity

Tomahawk

- 2002 - good uniform establishment of stand
- 2001 - remains poor, a few new seedlings emerged over the season
- 2000 - generally good plant population, poor plant population in seeding track
- 1999 - good uniformity

Carrot Creek

- 2002 - good uniform establishment of stand
- 2001 - good plant vigor but with generally uniformly lower plant populations across the stand and particularly in seeding tracks where seedlings were stressed during emergence
- 2000 - fair to good uniformity, poorer growth in high moisture areas;(SE corner,west end)
- 1999 - good uniformity, higher moisture area to NE corner

Breton

- 2002 - poor uniformity in establishment, early emerging seedlings died back during the hot dry conditions and there was only a slight recovery later in the season, at this point adequate establishment is questionable
- 2001 - fair to good uniformity
- 2000 - good uniformity
- 1999 - good uniformity

Alder Flats

- 2002 - fair establishment, as in Breton some early seedlings died back during the hot dry conditions but there appeared to be slightly better recovery later in the season
- 2001 - fair to good uniformity
- 2000 - good uniformity
- 1999 - good uniformity

Attachment B

WCAS

BIOMASS SAMPLING REVIEW

| <u>YEAR</u> | <u>ACTIVE SUB-PLOTS</u> | <u># OF HARVESTS</u> | <u>TOTAL SAMPLES(alf+wds)</u> |
|-------------|---|----------------------|-------------------------------|
| 1997 | VG 95,96; TM 95,96 AF 96; BTN 96 | 12 | 384 (768) |
| 1998 | VG 95,96,97 TM 95,96,97 | 12 | 432 (864) |
| 1999 | VG 96,97,98 TM 96,97,98 CC 98 | 14 | 504 (1008) |
| 2000 | VG 96,97,98,99 TM 96,97,98,99 CC 98,99 | 20 | 720 (1440) |
| 2001 | VG 97,98,99,00 TM 97,98,99,00 CC 98,99,00 | 22 | 792 (1584) |
| 2002 | VG 97,98,99,00,01 TM 97,98,99,00 CC 98,99,00,01 | 26 | 936 (1872) |
| | TOTALS | <u>106</u> | <u>3768 (7536)</u> |

Attachment C (1 of 2)

West Central Airshed Society

Alfalfa Biomonitoring - possible streamlining options

- 1a - reduce the number of biomass collections from 6 sets per harvest to one set at the end of the 60 day growth period
 - maintain the height measurements and stem counts at 10 day intervals
 - assumption that the data collected over previous years can be used to correlate height and stem counts to growth curve

- 1b - reduce the number of sets collected per harvest, for example increase sampling interval to 12 or 15 days to maintain 60 day growth period, this would allow for the collection of 4 or 5 complete data sets

- 2 - reduce the number of sub-plots per site that are actively monitored each season
 - for example; monitor each years seeding for the following three year period
 - for 2003 this would be VG- 00, 01, 02; Tom- 99, 00, 02; CC- 00, 01, 02

- 3 - reduction in destructive sampling would reduce plant loss and weed encroachment and could allow for reduced plot size requirements
 - consideration: to maintain future flexibility to return to current procedures, the minimum area requirement is 72 sampling blocks per year (18 sq.m.) or 54 sq.m. over a three year period. With allowances for a minimum 0.5 meter buffer and a 25% surplus area as safety for mis-seeding, drowning out etc. minimum size would be about 6X12 meters

Attachment C (2 of 2)

WCAS Biomass Sampling

3 Year Projection-option 1

ASSUMPTIONS

- 3 active sub-plots per site
- physical biomass samples collected at the end of each growth curve only (60 days)
- height and stem counts taken at 10 day intervals during growth period

| <u>YEAR</u> | <u>ACTIVE SUB-PLOTS</u> | <u># of HARVESTS</u> | <u>TOTAL SAMPLES(alf+wds)</u> |
|-------------|---|----------------------|-------------------------------|
| 2003 | VG 00,01,02 TM 99,00,02 CC 00,01,02 | 18 | 108 (216) |
| 2004 | VG 01,02,03 TM 00,02,03 CC 01,02,03 | 18 | 108 (216) |
| 2005 | VG 02,03,04 TM 02,03,04 CC 02,03,04 | 18 | 108 (216) |
| | <u>TOTALS</u> | <u>54</u> | <u>324 (648)</u> |