

From: Web E-mail - Mayor's Office
Sent: Thursday, August 08, 2019 9:17 AM
To: Web E-mail - City Clerks
Cc: Loewen, Mairin (City Councillor)
Subject: FW: Please ensure that this E Mail with the Attachment is received by All Councillors.
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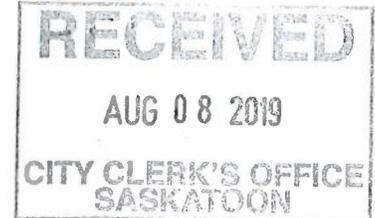
Good morning,

I'm forwarding the following email from Mr. Cooper as it is addressed to Saskatoon City Council.

Thanks,
Shelley

Shelley Burke | tel 306.975.3203

Office of the Mayor
City of Saskatoon | 222 3rd Avenue North | Saskatoon, SK S7K 0J5
shelley.burke@saskatoon.ca
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From: Bill Cooper [mailto: [REDACTED]]
Sent: Wednesday, August 07, 2019 4:03 PM
To: Web E-mail - Mayor's Office <Mayors.Office@Saskatoon.ca>; Loewen, Mairin (City Councillor) <Mairin.Loewen@Saskatoon.ca>
Subject: Please ensure that this E Mail with the Attachment is received by All Councillors.

Dear Saskatoon City Council:

Am sure you all went to School and learned that 'Climate Change ' was normal and that Co₂ was required for 'Plant Growth' as Professor Henry notes from the Dr. Bruce Kimball. [The Scientist that provided the Research for USDA] that increasing the Co₂ levels also increased the Crop yields. Furthermore when Canada is responsible for 1.6% why would you not react to our closest Competitor [USA] plus all our other Competitors such as Russia; Australia; New Zealand; China; India + USA who ignore the Paris Accord [what-ever that means]. Since some of you have little understanding of 'Climate Change'. Here is one Sk. Example ; Where I went to work following my U of S days was for a Prof' who farmed on the Regina Plains which by-the-way was a Lake about 90 feet deep, this gradually 'silted-up' to the beautiful Farm Land it is to-day. Please keep the \$\$ Billions in the bank, the Climate will to fine without your help.

Thanks ; William [Bill] Cooper P. Ag. , Saskatoon Taxpayer. [REDACTED] Irvine Ave. [REDACTED]

SOILS AND CROPS

CO₂, global climate and crop yields

It's not all bad news: research shows higher yields from higher levels of CO₂



Les Henry

About one year ago I began searching the scientific literature to determine the impact of increased carbon dioxide in our atmosphere on crop yields. It was a frustrating experience. Most of the articles seemed to have the pre-determined conclusion that CO₂ was a villain rather than the major nutrient in all of our crops.

A good example of the pre-determined conclusion was a paper that pointed out that increased CO₂ could result in less protein content in grain crops. That was very true but they neglected to mention that the decrease in protein was a result of the significant increase in yield. When we irrigate a wheat crop, without making sure that the nitrogen supply is adequate, the same reduction in protein results. Are these doomsday folks also saying that we should quit irrigating because it can reduce wheat protein of wheat if nitrogen is left out?

It was my good fortune to recently find a very old (1983) paper on the topic of CO₂ and agricultural yield. It was by a single author, Bruce Kimball of the United States Department of Agriculture in Arizona. He summarized more than 430 observations of the yields of 34 species grown with CO₂ enrichment. The data was extracted from more than 70 reports published over 64 years.

The data was primarily from greenhouse experiments but it did lead to the conclusion that a doubling of atmospheric CO₂ concentration could increase yields by 33 per cent.

More recently a technique has been developed to study enriched CO₂ effects under field conditions. The technique is widely known as FACE (Free-Air Carbon Dioxide Enrichment).

A recent (2016) FACE project in

Australia compared wheat yield with ambient CO₂ at about 370 ppm to CO₂ enriched to 550 ppm. Researchers compared two wheat varieties at two rainfed sites with two supplemental irrigation levels. The average wheat yield increase attributed to the elevated CO₂ level was 24 per cent at one site and 53 per cent at the second site. The yield stimulation was much greater under irrigated conditions. Under rainfed conditions, when the soil runs out of water, an Australian heat wave can lead to chicken feed in the combine hopper. The elevated CO₂ under heat-wave conditions reduced the amount of chickenfeed and increased larger kernels by about 10 per cent.

Also in 2016, Bruce Kimball reviewed field experiments dealing with the effect of increased CO₂ on crop yields over a period of 27 years since the first FACE methods were developed. That review included 14 C3 crops including wheat, clover, potato, barley, sugar beet, soybean, rape (precursor to our canola) and mustard. C3 crops are much more enhanced by CO₂ than C4 plants such as corn and sorghum which were also included in his review.

It was my great pleasure to have a phone chat with Bruce to get more details about the work. To make a long story short, he concluded that an increase of CO₂ to 550 ppm could result in a 19 per cent increase in yields of C3 grain crops.

After reviewing many scientific documents, I am convinced we must quit casting CO₂ as a villain that is going to bring about our demise. To the contrary, it offers much hope that we will be able to feed the hungry world.

GLOBAL CHANGES OVER TIME

Over past years I have read many books and articles dealing with the history of our climate and the many temperature swings from warm to very cold.

One such gem this year was *The*

Whole Story of Climate: What Science Reveals about the Nature of Endless Change. It was written by E. Kirsten Peters, a geology professor at Washington State University who was (now retired) also a communicator of science to the public.

We all have trouble thinking about the geologic time scale measured in billions of years. Even going back to the most recent Epoch takes us back 1.8 million years. We can think in millions when it is in dollars as many large farmers pour that much in the ground each year. But, when we think about years, a million is hard to visualize when our life span is in decades. E. Kirsten Peters solved this by comparing the most recent Epoch (Pleistocene: 1.8 million years) to the length of a football field: 100 yards.

During that long period of time it has mostly been cold, like glacier cold. There have been long periods (100,000 years or 5.5 yards on the football field) of cold interspersed with short periods (10,000 years or 0.5 yards) of warm. It is only during the warm periods that mankind has been able to flourish or even exist in our part of the world.

At one point in the book she shows the past 400,000 years as 25 yards on the football field. During that time there have been four very long periods (five yards) of bitter cold when glaciers covered all of Canada and northern U.S. plus Europe and more. Those long cold periods were interspersed with short periods (0.5 yards) of a warmer gentler climate that we are now enjoying. We are still recovering from the last glaciation.

That period of time has special meaning to me because of our 1980s to '90s soil salinity program. Geologist Earl Christiansen supervised our deep drilling work with test holes that showed evidence of all of those geologic times. In fact, much of our soil salinity is due to the many sand and gravel aquifers that resulted from all the water released in the warm interglacial periods.

The point that E.K. Peters makes is that what we should be worried about is cold not warm. The cold periods have wiped out many civilizations and reduced some populations to very desperate measures to try to stay alive. The very brief warm periods have been when life has been possible in our part of the globe.

She also reported that the change from warm to cold can happen very fast, in human time not geologic time. Even minor shifts in alignments between our Earth and life-giving sun, can yield big changes in climate. No one completely understands all the levers that control the climate shifts.

Peters also describes catastrophic events such as 1315 in Western Europe when Noah's flood-type relentless rains ruined all crops. Big rains are not a new phenomenon.

The book also makes the point that geology provides us with the facts about how the climate has changed over millennia. The hysteria about the doomsday effects of global climate change is based on mathematical models. Mathematical models have trouble predicting our weather for more than a week or so in the future — what faith should we have in models that claim to predict decades in to the future?

The Whole Story of Climate... is a good read and a paperback version can be purchased online for \$19.

OUR LOCAL CLIMATES

There is much ado about warming that is going to fry our crops and leave us begging for a cold day. But, I have news for the global warmers. In this part of the world our January, February and March average temperatures have indeed risen noticeably over the past few decades. We do not grow many crops in January, February and March.

But, our July temperature is actually becoming cooler. Now why would that be? Think back to the hot June/July days of 1987 and 1988. At that time, we had 15 million acres of bare summerfallow in Saskatche-

C3 and C4

Scientists group plants into C3 and C4 categories based on how plants use carbon dioxide. About 85 per cent of plant species, including wheat, canola, flax and soybeans, are C3 plants, referred to as "cool environment" plants. C4 plants include corn, kochia and green foxtail. C4 plants thrive under hot conditions, but are not as competitive in wet years. C4 plants have developed a more complicated process to make use of CO₂.

— Les Henry

wan alone. In 1988 it was so dry that many crops did not even emerge so that added more bare acres to reflect the heat and fry us out.

Now we have very little bare ground and millions of acres of light-coloured canola flowers that also have a cooling effect.

MY CONCLUSIONS

I've come to two conclusions on this topic.

1. Atmospheric CO₂ has risen in recent decades and that increase has most likely influenced crop yields in a positive way.
2. Over the past million years global climate has alternated from long periods of very cold to much shorter periods of warmer, gentler conditions. Cold has disrupted human survival but societies have thrived in warmer periods. We have much more to fear from cold than warm. GM

J.L. (Les) Henry is a former professor and extension specialist at the University of Saskatchewan. He farms at Dundurn, Sask. His book, "Henry's Handbook of Soil and Water," mixes the basics and practical aspects of soil, fertilizer and farming. To order a signed copy, send a cheque for \$50 (includes shipping and GST) to Henry Perspectives, 143 Tucker Cres, Saskatoon, Sask., S7H 3H7.

Highest-ever wheat price

This little book from UGG (United Grain Growers) came in a package I bought at an auction sale many years ago. (UGG started *Gardnews* in 1975. The book shows tables of wheat, oats and flax prices from September 1916 to August 1917.

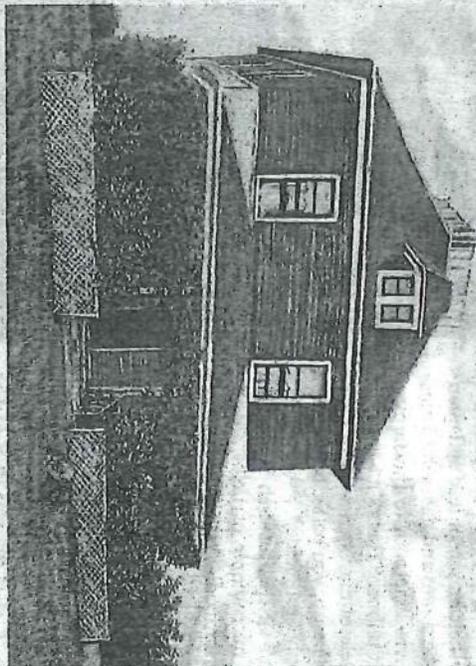
On May 11 and 12, 1917, the Winnipeg cash price of wheat hit \$3 per bushel. When I plug "\$3" and "1917" into the Bank of Canada Inflation Calculator it spits out \$48.22.

I guess that should stand as the all-time record high price for wheat. It is no surprise that grandfather Jerome could build this grand home in 1917. The baby seated on the lawn is your fearless *Gardnews* columnist.

UNITED GRAIN GROWERS, MAY, 1917.

WHEAT		OATS		FLAX	
Qua.	Mar.	Qua.	Mar.	Qua.	Mar.
11	2.25	1.25	1.25	1.25	1.25
12	2.25	1.25	1.25	1.25	1.25
13	2.25	1.25	1.25	1.25	1.25
14	2.25	1.25	1.25	1.25	1.25
15	2.25	1.25	1.25	1.25	1.25
16	2.25	1.25	1.25	1.25	1.25
17	2.25	1.25	1.25	1.25	1.25
18	2.25	1.25	1.25	1.25	1.25
19	2.25	1.25	1.25	1.25	1.25
20	2.25	1.25	1.25	1.25	1.25
21	2.25	1.25	1.25	1.25	1.25
22	2.25	1.25	1.25	1.25	1.25
23	2.25	1.25	1.25	1.25	1.25
24	2.25	1.25	1.25	1.25	1.25
25	2.25	1.25	1.25	1.25	1.25
26	2.25	1.25	1.25	1.25	1.25
27	2.25	1.25	1.25	1.25	1.25
28	2.25	1.25	1.25	1.25	1.25
29	2.25	1.25	1.25	1.25	1.25
30	2.25	1.25	1.25	1.25	1.25
31	2.25	1.25	1.25	1.25	1.25
32	2.25	1.25	1.25	1.25	1.25
33	2.25	1.25	1.25	1.25	1.25
34	2.25	1.25	1.25	1.25	1.25
35	2.25	1.25	1.25	1.25	1.25
36	2.25	1.25	1.25	1.25	1.25
37	2.25	1.25	1.25	1.25	1.25
38	2.25	1.25	1.25	1.25	1.25
39	2.25	1.25	1.25	1.25	1.25
40	2.25	1.25	1.25	1.25	1.25
41	2.25	1.25	1.25	1.25	1.25
42	2.25	1.25	1.25	1.25	1.25
43	2.25	1.25	1.25	1.25	1.25
44	2.25	1.25	1.25	1.25	1.25
45	2.25	1.25	1.25	1.25	1.25
46	2.25	1.25	1.25	1.25	1.25
47	2.25	1.25	1.25	1.25	1.25
48	2.25	1.25	1.25	1.25	1.25
49	2.25	1.25	1.25	1.25	1.25
50	2.25	1.25	1.25	1.25	1.25
51	2.25	1.25	1.25	1.25	1.25
52	2.25	1.25	1.25	1.25	1.25
53	2.25	1.25	1.25	1.25	1.25
54	2.25	1.25	1.25	1.25	1.25
55	2.25	1.25	1.25	1.25	1.25
56	2.25	1.25	1.25	1.25	1.25
57	2.25	1.25	1.25	1.25	1.25
58	2.25	1.25	1.25	1.25	1.25
59	2.25	1.25	1.25	1.25	1.25
60	2.25	1.25	1.25	1.25	1.25
61	2.25	1.25	1.25	1.25	1.25
62	2.25	1.25	1.25	1.25	1.25
63	2.25	1.25	1.25	1.25	1.25
64	2.25	1.25	1.25	1.25	1.25
65	2.25	1.25	1.25	1.25	1.25
66	2.25	1.25	1.25	1.25	1.25
67	2.25	1.25	1.25	1.25	1.25
68	2.25	1.25	1.25	1.25	1.25
69	2.25	1.25	1.25	1.25	1.25
70	2.25	1.25	1.25	1.25	1.25
71	2.25	1.25	1.25	1.25	1.25
72	2.25	1.25	1.25	1.25	1.25
73	2.25	1.25	1.25	1.25	1.25
74	2.25	1.25	1.25	1.25	1.25
75	2.25	1.25	1.25	1.25	1.25
76	2.25	1.25	1.25	1.25	1.25
77	2.25	1.25	1.25	1.25	1.25
78	2.25	1.25	1.25	1.25	1.25
79	2.25	1.25	1.25	1.25	1.25
80	2.25	1.25	1.25	1.25	1.25
81	2.25	1.25	1.25	1.25	1.25
82	2.25	1.25	1.25	1.25	1.25
83	2.25	1.25	1.25	1.25	1.25
84	2.25	1.25	1.25	1.25	1.25
85	2.25	1.25	1.25	1.25	1.25
86	2.25	1.25	1.25	1.25	1.25
87	2.25	1.25	1.25	1.25	1.25
88	2.25	1.25	1.25	1.25	1.25
89	2.25	1.25	1.25	1.25	1.25
90	2.25	1.25	1.25	1.25	1.25
91	2.25	1.25	1.25	1.25	1.25
92	2.25	1.25	1.25	1.25	1.25
93	2.25	1.25	1.25	1.25	1.25
94	2.25	1.25	1.25	1.25	1.25
95	2.25	1.25	1.25	1.25	1.25
96	2.25	1.25	1.25	1.25	1.25
97	2.25	1.25	1.25	1.25	1.25
98	2.25	1.25	1.25	1.25	1.25
99	2.25	1.25	1.25	1.25	1.25
100	2.25	1.25	1.25	1.25	1.25

SOURCE: UGG



SOURCE: FROM PAINTING BY FRAN HENRY (1942-1988).