Premier's Agriculture Scholarship

Sustainability in Agriculture

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Over the last 10 years or so the word “sustainability” has been in the public arena in many areas of society. In New South Wales there are many and varied examples of schools and colleges practising and teaching to students various types of sustainable agricultural and horticultural practices. Unlike the United States of America (USA) where many programs are nationally based, here in the NSW schooling system, there are various aspects of sustainability written across many curriculum areas. The primary focus of my study trip then was to investigate sustainable farming systems and sustainable farming practices operating in schools and colleges throughout the USA.

The USA Agriculture in the Classroom program strongly supports individual state programs that operate in every US state. Each state organisation addresses agricultural education in a way that best suits the needs of the state and the interests of the farmers, farm organisations, agribusiness and most importantly the students of the US at all levels of their education.

In this context, I decided to focus my visits and investigation in four different but integrated areas that related to the sustainability of the farming environment.

Initially I visited the state of Iowa to see how farmers and their farming practices are addressing the sustainability concept and how these farmers then involve the local communities in which they are located and more importantly the children of these communities. Iowa is a state in the mid- west of the US, it is one of the major dairying states behind California and Wisconsin. Iowa, like many other mid- western states also produces large volumes of corn that is either turned into corn silage to feed the dairy herd or used for ethanol production. The state also has extensive wind farm operations that produce power not only for individual farms but for the state grid. Many farms visited where in the process of installing wind turbines for generating their own power to run their milking parlours as well as associated refrigerated cooling systems for their milk. Although most farms had only one turbine, many had multiple turbine installations that fed power back into the national grid system. Some of the larger farms had up to 40 turbines operating. On just about every road driven in Iowa it was possible to view wind turbines operating in the fields. All dairy farms and piggeries by state laws have to practice sustainable practices such as effluent recycling. During the winter period when the state is covered to a considerable depth in snow and the dairy herds are housed inside, all effluent is scraped from the milking barns and stored outside. The effluent is immediately covered by falling snow or freezes at night and remains so until the spring thaw. During spring, once the fields have been ploughed the stored material is spread back over the pasture. All materials produced by animals must be retained on farm, unlike here in NSW where there are many instances of effluent from farms entering streams and the water table. There are no smell issues due to the material being frozen. Once spread the material is immediately ploughed back into the ground, again eliminating any chance of smell. To support and encourage younger members of the communities, many farming operations are heavily involved in encouraging farm visits by people in their local community, especially school children to show how primary production of their food can be produced in a sustainable manner. It was common practices that many farms I visited had at least two school visits per week from primary, middle and high school students. Many dairies had set up resource/ classroom/observation areas where students were spoken to, given visual presentations and were able to access literature as to the nature of the farming operation and how that operation effected the environment. In speaking to students from a school that was on one of these excursions it was very evident that the students had a very sound knowledge on where and how their foods are produced and how farms are producing this food. Not only did the school children have the opportunity to visit farms to observe how their food is initially produced, in many areas they were also given access to secondary producing facilities such as milk manufacturing factories that produce whole milk, and milk by product such as yoghurts and ice cream. In speaking to teachers it was evident that the majority of schools in individual towns visited a farm, unlike here in NSW where many city children have never been on a farm and their only contact with agricultural products is in a Coles or Woolworths supermarket. It was also very evident that unlike NSW and Australia in general where large overseas companies are buying up our agricultural land and family farms are diminishing, in the US family farms make up the greatest proportion by far of farming operations. Most farms are relatively small compared to NSW and very intensively farmed. Concern was also expressed by teachers at North East Iowa Community College about the increasing age of US farmers, currently around 58 years of age, very similar to Australia. In Iowa and other states visited it was evident that specialised colleges, like the one just mentioned, had been set up to train the future farmers of America. Another interesting aspect of the dairying farming community was the very significant use of up to date and modern technology. Adaway dairy for example had just installed 2 robotic milking machines at $USD200,000 each. Many farms already had or were currently installing robotics. The whole country seemed to be moving at a much faster rate with technology and sustainable farming practices than here in NSW.

Tertiary Agriculture Education

From Iowa I travelled to the State of Wisconsin and based myself in the city of Madison, which is the home of the largest university in the state, University of Wisconsin. A total of 52,000 students attended this university alone. It was here that I would focus on the tertiary level of education to observe how the university sector was looking at sustainable farming practices. On my day of arrival, students from all over the state of Iowa had descended upon the University for the State Final of 4-H judging of livestock enterprises. One hundred and eighty six schools were represented, totalling 1800 students judging everything from an agricultural background from honey, eggs, horse, cattle sheep, meat and so on. It was similar NSW, Royal Agricultural Society (RAS) judging of animals but on a much larger scale with more student involvement and over a greater range of plant and animal industries. The 4-H program is directly linked in many cases through the schools agriculture programs but run as an extra-curricular activity. Dianne Mayerfield, head of the Centre for Integrated Agricultural Systems at the University of Wisconsin-Madison informed me that the sustainable agricultural programs are currently operating in Wisconsin were initially instigated by farmers themselves in the late 1980’s. These programs and curriculum resources were and are still being developed by the Centre of Integrated Agriculture Systems at the university. The aim is to teach sustainable and organic farming practices to students in universities and high schools. The university has developed a program called Toward a Sustainable Agriculture which is online, consisting of 6 modules with the emphasis on sustainability, case studies in agricultural production and agricultural economics. At the time of my visit the site was receiving 400 hits per day. Currently the centre is working with farmers on disposing of effluent using biological digesters in the production of methane that can then be used as a fuel source to generate electricity on farms. In Green Bay I observed how the US Technical Colleges are also involved in teaching organic and sustainable farming techniques. One method devised was “a truck to school” program whereby a semi- trailer travels the state showcasing various courses that students may undertake at technical colleges. At Stevens Point, Portage County, I visited a number of community gardens, where the public can lease plots of land from the local council and grow their own produce. This way the family and community are involved in producing their own food. Excess food is given to food shelters. My final day at the university was spent attending lectures on a new course called Agroecology and participating in seminar groups of post – graduate students structuring plays on topics based around current topical subjects such as intensively based animal industries ( Operation War Pigs), genetically modified (GM) food production and the use of chemicals.

Maine, Vermont and Oregon

In Maine, Vermont and Oregon, I visited many primary, middle and high schools to see what is being developed and delivered within the classroom. My first visit in Maine, in the New England region was to a primary school that was having as part of their May Day celebrations an open date for parents, friends and the local community. The teacher and students had set up 12 stations showing various agricultural practices such as water collecting and recycling and spoke to the visitors explaining what they had learnt in the classroom was now being put into practice. At the same venue I attended an in-service day for teachers of agriculture on how to grow fruit trees using sustainable techniques. There were approximately 40 attendees from all over Maine at this day. At the end of the day each participant was issued with a certificate of attendance so that they could be accredited and registered with the state school board.

My next stop was to the University of Maine talking to lectures and tutors as to the various courses offered to the students from this farming state. It was interesting to learn that there are more and more students taking agricultural type courses as many of the young people in Maine have intentions on pursuing a farming career. My next visitation was to a school that has been established to cater for students identified as “kids at risk”. It was a specialised school dealing with students that cannot cope within a normal schooling situation. The teacher to pupil ratio is 1:3 whereby each individual has developed and designed a project centred on an agricultural theme. I spoke to two of the students who showed me their individual learning programs and designs. They explained to me that they are coping much better in society as a result of this type of schooling. Students had set up a vegetable farm that supplied vegetables to the kitchen; they harvested maple syrup and processed it for sale as well as going off site to work on neighbouring farms after school to gain valuable practices that will enable them to find a job when they left the school. I then visited Medowmak School where the agriculture teacher who was in his seventies had set up within the school a seed savers project. The whole school agriculture program was based around collecting and cultivating seeds and plants from all over the world. The school had a collection of over 800 different types of seeds and readily supplied seeds to other schools both within the US and from other parts of the world. The school had also supplied seeds to the Nordic seed bank in Sweden. Next port of call was the Herring Gut Education centre, situated on the coast of Maine, a research facility that has the local primary school visit weekly. The students have set up a fish raising activity in conjunction with the research being done, selling the fish at marketable size to local restaurants and seafood outlets. The wastewater from the fish tanks containing the effluent from the tanks is continually fed into a hydroponics unit producing different lettuce varieties that in-turn were harvested and sold.

Vermont, the state with the smallest population was visited next. Burlington High School was my first visit where I learnt about the school cafeterias which occur in all schools throughout the US. This school provided breakfast for 600 students and again lunch for another 600 students out of a school population of 1100. I learnt that there are over 90,000 school pupils fed each day in Vermont at school. Many schools are subsidized by the tax payer. Much of the food is grown by the school or provided at a cheap cost by the farm to school network. The middle and primary schools that I visited are of a similar size to schools in NSW but all schools at whatever level of education seem to grow large amounts of vegetables that the students take home, sell to the school cafeterias or give to the local food shelters. There is a lot of good will and a strong sense of sharing in the community. Very few schools unlike those teaching agriculture in NSW have animals, and if they do the only animals I saw were poultry for egg production. For two days I was the guest at Shelbourne farms. This is a working farm of 1400acres that was donated to the state to be used as a non- profit education centre for sustainability. The farm has a fully operation dairy along with beef cattle, sheep, pigs, poultry as well as forestry, a timber workshop, a cheese making factory, farm animals and an education centre that was extremely busy hosting farm visits and tours.. From there I visited Barre Town Middle school to see a school where all teaching programs like maths, English, geography, history, science are based around the pupils’ gardens. Each class has set up a vegetable growing area and all subjects are aligned towards what the students grow. That night at a school in-service the teachers cooked a meal from produce from the gardens and then had to give a 5 minute talk on how they had integrated the gardens into their specific subject. Farm to School is a program that connects schools from K-12 and local farms with the objective of serving healthy meals in the school cafeteria, improving student nutrition, making students aware of health and nutrition opportunities and supporting local and regional farmers. The concept of Farmers markets and Town markets was also very evident within the state.

In Portland Oregon, I initially visited Clackamas High School Land lab. This school was solely devoted to teaching agriculture. The facility of 14 acres was situated in suburban Portland, about 10 minutes from the centre of the city. The school caters for approximately 20 students daily that attend from three surrounding high schools whom especially wish to study agriculture. Agriculture is the only subject taught at this school. The school has three full time agriculture teachers and there are currently 100 students attending the school. The students agricultural studies are solely based around animal enterprises unlike many other schools visited that primarily focus on plant production enterprises. The school operated with a pure bred flock of black Suffolk sheep, steers, pigs, poultry and rabbits.

The Food Innovation Centre, in downtown Portland was my next visit. Firstly it is a research facility that at the present time was investigating the labelling of raw agricultural products using a laser to etch information onto the surface of the produce, instead of using plastic stickers such as we do on many of our fruits such as apples and oranges. This process eliminates a waste issue with customers pulling off the sticky labels and using them as graffiti or throwing them onto the ground- a great environmental breakthrough. The centre also has a nutritionist working on new product designs and cooking methods so that the public may learn to obtain the most nutrition out of the food that they consume. Lastly the centre is involved in teacher training for the 189 school districts in Oregon. Ninety of these districts currently have farm to school programs operating.

Scio High School, situated about 60 miles south of the capital is what we would classify as a small country high school. The school population of 220 is mainly sourced from the surrounding rural communities. The community dictates what is to be taught. For example, forestry is the one of the major agricultural enterprises in Oregon. Students in year9 are taught how the climb trees using spiked boots and belts, use axes and chainsaws. Each topic in each subject is taught in a 3 week block.

Paul Reverre Middle School is a Californian state operated school, 20 minutes from the centre of Los Angeles (LA) that has a population of over 13 million people. The school covers 14 acres and has 2100 students from grade 5-8. Average class size is 38 pupils. Agriculture and Horticulture are taught by 2 teachers to all students. The school has well established vegetable production gardens and horticulture area focusing on citrus. The students that I spoke to were extremely proud of their gardens and the learning experiences and life skills that they had learnt for do these subjects.

The overall impression of the US Department of Agriculture (USDA) – Agriculture in the Classroom, along with the universities, agribusiness and farming communities is that of an integrated approach at all levels of the education system. From kindergarten students through to university post graduates to the farming communities and the agribusiness sector, all individuals are well versed on knowing where there food and fibre comes from, how it is produced and how its production is affecting their environment. Although the teaching methods are varied from state to state, their whole school syllabi are under a national body- USDA-Agriculture in the Classroom. Final school exams are set and marked at the national level, a system that we here in Australia are currently implementing.

Overall, at all levels, the people of the US are aware and knowledgeable about sustainable agriculture production and its effect on their environment.

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