

*The Cicerone Project Inc.*

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ABN 15 314 685 367

australian wool  
**another innovation**  
• limited

NEWSLETTER No 35

October 2005

**How are your pastures blooming since the glorious rain?  
Come and have a look at the magnificent examples on  
the Cicerone Farms ....**

**Better than 'Floriade' for a farmer!!**

## **PASTURE WALK**

**Thursday 20<sup>th</sup> October at 10am**

**Carol Harris - *The varieties and management of Fescue***

**Clare Edwards – *Pasture management through spring and  
summer this year***

**Jim Scott – *What Cicerone has taught us about pasture management***

**Justin Hoad – *Sacrifice paddocks and feeding the 2004 drop lambs***

**Silage from the Lucerne ... can anyone help with equipment???**

### **FUNDING**

At last! The Cicerone Board is pleased to announce that after much negotiation we have secured a further year of funding from AWI from 25<sup>th</sup> October 2005. This will be a harvest year and we will be concentrating our efforts on extracting the messages for producers from the huge amount of data collected since July 2000. Please let us know if you want to be involved with our Extension Committee

This will be the final year for the Project as we know it. However the Cicerone Farms and livestock are a valuable resource and it may be that there are other directions in which the project may head in the future, for example the potential AWI Pasture Demonstration Project. If you are interested in being involved with future applications for funding, then please think of joining the Board at the next AGM later in November. Please nominate by sending your name and address to Cicerone by November 1st.

We are also keen to welcome enthusiastic new members.... the more members the more 'clout' with all the funding agencies!

### **MISS THE SYMPOSIUM?**

**You missed a great day!**

Twenty six papers were presented covering a wide range of topics including climate, soil, pasture, management, wool characteristics, parasites, footrot, economics, trees, critical appraisals of each farm and researchers' and producers' perspectives. The Proceedings, close to a hundred pages, are now available in CD or book format for \$25 including postage. Order your copy using the enclosed form

## **PASTURE ESTABLISHMENT ON CICERONE**

JUSTIN HOAD Farm Manager,

### **INTRODUCTION**

The guidelines for the Cicerone farmlets specify that Farmlet A should aim for 100% sown species whilst Farmlets B and C are aiming to maintain existing native, naturalised and sown pastures with minimal need for pasture replacement. In order to quickly differentiate the three different farmlet management strategies, considerable sowing has taken place especially on Farmlet A over the past five years.

The following guidelines were used on the Cicerone farmlets for direct drilling perennial pastures. Similar recommendations are promoted by extension agents and seed re-sellers. The principles of pasture establishment have been well documented in the Prime Pastures Programme 'Pasture Establishment Guide' available from NSW Department of Primary Industries (Keys, 1996). Interested readers should familiarise themselves with the 8 steps to achieving successful establishment published in the Prime Pasture Establishment Guide.

In brief, the better the preparation, the better the result. As the proportion of annual weedy species in the paddock to be sown increases, the longer the preparation period prior to sowing the perennial pasture needs to be.

On Cicerone, we have found that three sprays are necessary to reduce the risk of failure; even in the serious drought year of 2002, we successfully established two paddocks in that autumn.

The first spray is often a spray top in spring to prevent seed set of annuals. This is done when the seed of the target species (e.g. *Vulpia*) is at the milky dough stage. Spray topping is most effective when pastures have been grazed down hard at the end of winter, then spelled to allow plants to green up and it starts to set seed.

Once the paddock has 'greened up' again in summer, a second spray is knockdown spray is applied to kill new germinations and most importantly to conserve soil moisture from summer storms. Then, after the annuals have germinated in autumn, a third spray is applied about 10- 14 days before sowing. Before each spray the paddock should have greened up to give a good kill. Grazings should be intensive to trample any standing dry grass.

### **THE SOWING PROCESS**

The Cicerone project has sown 11 paddocks over five years, from 2000 to 2005 totaling 63ha. One paddock (A1) has recently been sown to a lucerne/phalaris/chicory pasture. Two paddocks have been sown to short-term, high performance Italian ryegrass, and the remainder have been sown to long-term fescue/phalaris/white clover based perennial pastures. Two adjacent paddocks on farmlets B and C (4 ha each) were sown to a similar perennial pasture in 2004.

### **RESULTS**

Not all of Cicerone's sowings have been successful. In June 2000, when Cicerone was keen to demonstrate progress in differentiating the farms from each other upon commencement, a perennial pasture was sown with just one pre-sowing spray. The result was a poor germination, due to little stored moisture and weed competition. The following are things to avoid:

- Sowing with too few sprays. In 2000, there was an establishment failure due to inadequate weed control.
- After the drought, paddock "A5" was prepared for sowing but with no ground cover and a summer storm, soil was lost and some capping occurred resulting in poor initial pasture vigour that had to be remedied with supplementary nitrogen applied after initial establishment.

The most successful pasture sowing, under the challenging circumstances of the 2002 drought was paddock "A2" which was sown in April 2002 following three sprays. Fortunately there was good rain during the fallow period and the pasture germinated and grew to around 200 nun high and then wilted but nevertheless survived the severe drought of 2002.

A more devastating effect was grazing with ewes over lambing, as the "A" farm had run short of feed. Best practice grazing of newly sown pastures would be with cattle for the first 3-4 years with some form of rotational grazing. Because of constraints of paddock numbers and numbers of animal mobs, this is not feasible on the Cicerone farmlets.

## DISCUSSION

Practices such as burning and ploughing should be avoided as they leave the ground bare and susceptible to erosion. This can also deplete moisture reserves. If possible a mat of litter should be left to protect the soil from raindrop impact and to help with infiltration, particularly on steeper slopes.

We cannot afford to take the risk of soil loss as it is our most important resource, we do not have much topsoil and they are not making much more of it!

## SUMMARY

- Plan 1 year ahead and get prepared.
- Commence control of weeds and pests the year before
- Correct soil nutrient deficiencies.
- Graze down hard at the end of winter
- Absolute weed and pest control.
- Maintain ground cover as much as possible
- Don't burn off the ground cover.
- Don't plough light soil; direct drilling can give equivalent results.
- Three spray technique, for good weed control and moisture conservation
  - 1) Spray top (low rates of glyphosate) in mid-spring when annuals are seeding
  - 2) Spray fallow during summer using glyphosate.
  - 3) Spray out in autumn after germination of annuals, about 10 days prior to sowing
- Ensure sufficient soil moisture.
- Sow seeds accurately and at a shallow depth.
- Don't rush in, wait for annuals to germinate before last spray.
- Don't take short cuts - use recommended seed and soil treatments for pests.
- Preferably graze for short periods with cattle over the first year or so to ensure plant survival. Monitor newly sown paddocks closely.

## REFERENCES

Keys, M. (1996). Pasture Establishment Guide. Prime Pastures Programme. (NSW Agriculture). 64 pp.

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## **NSW Department of Primary Industries has moved to the UNE campus...**

C2, Earth Sciences Building on the Ring Road. Phone 02 6738 8500, fax 02 6772 8664

Remember to take your \$1 and \$2 coins with you when you go to find a parking space!

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**Thank you to Hugh Sutherland, founder member of the Cicerone Board, who has resigned from the Board to pursue other interests.** It has been a long road since the idea of Cicerone was first mooted and Hugh was there right from the start. It was due to the energy, enthusiasm and determination of the original producers which led to the birth of The Cicerone Project and, as the initial Chairman of the Board for five years, Hugh guided the fledgling organisation along. The Symposium in May was a culmination of all those hours discussing the farmlet set-up and their management practices as well as all the other trials that Cicerone has run. Thanks Hugh.

## **WHAT HAVE WE LEARNED? - A PRODUCER'S PERSPECTIVE –**

HUGH SUTHERLAND, Inaugural Chairman, Cicerone Project, "Deeargee", Uralla NSW 2358

I have been asked to talk to you about my views on the benefits that I, and the wider extensive animal industries, have derived from the Cicerone Project since its inception.

As a sheep, wool and beef producer I believe that I have gained many insights into the problems that confront all producers in these difficult times of volatile seasons and fluctuating markets. The bottom line is that there is never enough money or time to do all the things you want to do.

The Cicerone Farmlets are a demonstration farm only. They are supposed to reflect as many aspects as possible of a commercial farm business. I have selected ideas from the different operations on the farmlets and applied these to my business. I have not adopted the entire strategy of any one farmlet. By way of example:

### **GRAZING MANAGEMENT VERSUS INPUTS**

Against the backdrop of the Cicerone farmlets, I have been trying to reconcile, in my own mind, the balance between the importance of grazing management and inputs - the inputs being principally fertiliser and improved pastures. Getting these things right are critical to the success of our businesses. My comments are to be taken in the context of a principally merino breeding operation with trading cattle being an opportunity enterprise. I believe that, for my business, it is more important that I give grazing management a higher priority. To this end, I have focused much of my attention on fencing and water. Obviously whenever possible I will also address the need for inputs. I have made this decision based on a number of factors. These include the relative cost of each activity, the potential overall gain to my business given my enterprise mix and market and seasonal factors.

### **INTERNAL PARASITE MANAGEMENT**

Internal parasite management is rapidly becoming more important as our available drenches succumb to resistance. Grazing management, rest periods and related animal health issues are important tools in maintaining productive animals. Cicerone, and in particular Dr. Betty Hall, are helping many producers design strategies to overcome this growing problem.

### **SEMINARS AND FIELD DAYS**

On an individual level I have also learnt much from the field days and seminars that Cicerone regularly organises. The seminars have ranged from footrot, the wool stockpile management and disposal, Occupational Health and Safety (Insurance), pastures, animal health and others too numerous to mention.

### **INDUSTRY BENEFITS**

In my view, Cicerone has been a significant benefit to animal production industries in general. I will mention only two important gains today. The first involves footrot. Thankfully I do not have first hand experience with this problem. As a result of a seminar organised by Cicerone, the difficulty in correctly diagnosing individual strains of footrot is much closer. Cicerone has played a significant role in the development of a DNA test for footrot which is now in the process of commercialisation. Without the impetus provided by Cicerone, such a test would still be a long way off.

I would also like to emphasise that Cicerone has, in many cases, acted as a bridge between the research scientists and livestock producers. It is probably not possible to measure the change in attitude and indeed co-operation that has occurred between these groups as a result of their participation in Cicerone activities.

I would like to finish up by making the point that extension and adoption are a vexed issue for which we will never achieve industry consensus. The research funding organisations are also struggling with this issue and I believe have grossly underestimated the value of a group such as Cicerone in this context. Whilst Cicerone needs to continue to learn and evolve as a group I believe that it is a big step in the right direction of improving the ability of livestock producers to adapt to a changing production environment.

## Nutrient cycling

by Dr. Chris Guppy, UNE

On the Northern Tablelands, nutrient cycling issues are related mostly to N, P and S as these elements are the most limiting for pasture production. The goal of nutrient cycling is ultimately to have the important elements in the soil ending up in the animal via the plant. Understanding nutrient cycling in pastures is important with respect to interpreting soil tests, fertiliser application and pasture productivity. This will briefly explain nutrient cycles in the SOIL, and then nutrient cycles between the SOIL-PLANT-ANIMAL. Essentially, the reason nutrient cycling is important is that it keeps nutrients moving in **FORMS** that are available to plants.

### *Soil nutrient cycling*

Not all of the nutrients in the soil are actually available to a plant. Hence measuring the total amount of that element in the soil is not sensible as it doesn't actually mean all that much. To end up cycling through the soil-plant-animal system ultimately the nutrient in question, be it P or S or N, **HAS** to end up in the soil water (or soil solution). This is the only way that a plant can access the nutrient. It has to have been dissolved in the soil solution for a root to be able to extract it. Plants can't take up solid forms of nutrients. Therefore distinguishing between the nutrient that is in the soil solution and the nutrient that is structural (found in organic matter or clay) is really important. The amount of nutrient in the soil solution is very low compared with the total amount of the nutrient in the soil. In fact, for many nutrients the amount in the soil solution represents <1% of the total amount present!

From a plants point of view, the amount in the soil solution is between 1 and 10% of what it actually needs to grow well. In contrast, the total amount of nutrient in the soil can be 20 to 100 times MORE than is required annually. Therefore the key piece of information we need to know is the capacity of the soil to replenish the amount of nutrient in the soil solution. Roots have the capacity to withdraw nutrients from the solution, even though the amount in them is far higher than the amount in the soil solution. Speaking technically, when a plant removes a nutrient from the soil solution, the equilibrium between the solution and the soil is changed. This results in the nutrients that are 'stored' in the soil being released to the solution. When you look at a soil test report, most of the numbers are trying to give you a picture of how much of this nutrient that can be easily (within a few months) transferred from the organic matter or clay in the soil into the soil solution; and ultimately the plant. Rapid replenishment comes mainly from nutrient ions at the soil surfaces (exchangeable, adsorbed, precipitated). The term labile is used to describe these easily exchangeable (and solution) concentrations of elements.

Knowing this, total nutrient supply is usually not a good indicator of the amount that is available for the plant because the various fractions in which elements exist in the soil have differing degrees of availability. Determining relative availability can be done using chemical or biological methods. Chemical methods rely on finding an extractant that can remove that portion of the labile fraction that is available to plants, whilst biological methods measure the uptake of elements and concentration in plant tissue over a growing period. In our pasture soils we want good amounts of N, P and S (and other elements of course) in the soils that can maintain soil solution levels high enough for plant growth. Soil tests essentially try and measure how much labile N, P and S is present.

Nitrogen and S mainly accumulate through atmospheric deposition or fixation but are then stored in the soil in predominantly organic forms (90-98% organic). The amount of N or S in the soil solution is therefore maintained through mineralization of organic matter. Mineralisation of organic matter is undertaken by soil micro-organisms that usually need the same conditions that plants need to be able to grow and multiply (and subsequently release nutrients). That is they need a bit of warmth, a bit of water, a bit of air, the right

pH (slightly acidic) and a bit of time. This is why measuring things like nitrate in the soil solution is not a very good indicator of N availability. The number is influenced so much by the climatic conditions that prevailed in the few weeks before the soil was sampled! Unfortunately a measure of the labile N is not easy to come by as it relies so much on mineralisation of organic matter. Hence the surrogate use of essentially the soil solution level. The S test is more reliable and takes into account already existing sulfate, plus that sulfate that can easily mineralise from organic matter. This has been calibrated and tested for the Tablelands.

Phosphorus is released originally through weathering of rock, yet 20-80% is stored in the soil in organic forms. In soils that hold inorganic P strongly, storage of P in organic forms and release through mineralization reactions are particularly important for plant nutrition. Over time, a lot of the P in the soil becomes strongly attached to the oxide surfaces and, from the plants point of view, is lost entirely. This is why we add fertiliser to soil that may already have tonnes of P already present. That P is not available to the plant, it is not labile P. When we fertilise, we do so usually with relatively available (i.e. soluble forms of nutrient) such as superphosphate. This increases the amount of AVAILABLE phosphorus in the soil water (when there is any!). When that is taken up by the plant, it is concentrated in the plant tissue at a rate of about 0.2 or 0.3 % of P in the tissue. This is equivalent to 2000 to 3000 parts per million! Which is a very much higher concentration than is in the soil (e.g. 20 or 30 parts per million (or mg/kg) of available P in most paddocks of the Cicerone farmlets B and C). That is, the plant concentrates the nutrients from the soil to give the animal an adequate diet for growth. The P test has also been calibrated for the Tablelands so we know just how much labile P we need to find in our soil for good healthy legume pastures.

### ***Soil-plant-animal nutrient cycling***

Plants concentrate up N and S in their tissue that is then consumed by the grazing ruminant. Part of it is converted to protein, but a significant proportion is passed out in dung and urine. This is again, an available, organic form of N and S, which has to be mineralised to inorganic forms such as sulphate, nitrate or ammonium and put into solution before the plant can then concentrate them up again. Most of the nutrients taken in by the animal are re-cycled. When an animal has higher quality feed, it can digest more and so turns over more feed as it eats more and defecates more. It is thus cycling the nutrients, putting them back into the soil as it feeds. The grazing ruminant removes relatively little in terms of net nutrients. The key thing about this cycling through the animal and back to the soil is that usually the FORM of the nutrient that is deposited is also relatively available to the plant (like the superphosphate).

By having the nutrient cycling we are protecting it from the reactions in the soil that would result in its loss from the pasture system, and we are reusing this important fraction of soil nutrient. The most rapidly cycling nutrients are N and S with large amounts cycled quickly. Thus, for a productive system, we need rapid cycling of nutrients with minimal amounts being lost through leaching (e.g. as nitrate) or through volatilization (e.g. as ammonia gas). We get little loss of P – apart from it being unavailable when it gets sorbed onto clay particles too tightly. So our aim is to have enough cycling nutrient to allow plants and animals to grow well, if we don't have enough labile (or available) P and S then we should consider 'priming the pump' of nutrient cycling to get the legumes growing well in our pastures and grabbing all that free N from the sky!!

*Join the Cicerone Board and have your input into future funding applications*

**WE WANT TO CUT SOME SILAGE FROM THE LUCERNE Paddock ON FARM A, CAN ANYONE HELP WITH EQUIPMENT? PLEASE RING 6778 3871**

## Some comments on the value of native grasses on the Cicerone farmlets

by Prof Jim Scott

Since the Cicerone symposium held in May, some questions have been asked about the comments I made on the day on the value of the native grasses on the Cicerone farmlets. I had explained that on Farmlet B, as the percentage of sown perennial grasses has declined since July 2000, it has been matched by an increase in native perennial grasses, and that this may lead to lower production. A similar but less pronounced decline in sown perennial grasses and increase in native perennial grasses has also occurred on Farmlet C. In contrast, the percentage of sown perennial grasses on Farmlet A has been relatively stable but of course this has only been possible due to much sowing of pastures over these past several years (at considerable cost).

The question in my mind about the increase in native perennial grasses is what will the consequence of this be on long-term production and profitability as they can be associated with lower production. The evidence for this statement comes from a national experiment conducted over 4 years in the Sustainable Grazing Systems (SGS) key program. The conclusions drawn in that work published by Paul Sanford and colleagues over all 8 sites of the SGS experiment were that herbage accumulation (or in other words, the sum of pasture growth over time) was in general lower when native grasses comprised a greater percentage of the sward.

It is early days to conclude that the same applies on the Cicerone farmlets. As was explained at the symposium, we now have excellent botanical composition data for every paddock on each farmlet since early 2000. The task remains to analyse the trends in the various species over time and try to associate that with animal performance over time.

In the case of the Cicerone farmlets, much of the native perennial grass component is comprised of species such as tussocky poa, *Microlaena* and red grass. Typically, these grow more in the warmer months and the residual herbage left to support animal

growth through winter months is of poor quality. That is not to say that there are not valuable native grasses which can support good wool growth, especially when supplemented with some clover and some fertiliser inputs. However, since Cicerone began treatments in 2000, none of the farmlets have witnessed much clover.

It remains to be seen whether we will get much clover in any paddocks if and when we get some extended periods of good soil moisture. We have certainly attempted to increase clover on all farmlets but, given that we have had below average soil moisture conditions since 2000, it is perhaps not too surprising that we have not seen much clover yet.

In the research we published in 2000, based on 3 years of research conducted by the University of New England in conjunction with CSIRO, we concluded that a more profitable and sustainable system is one which is dominated by deep rooted, fertiliser-responsive perennial grasses with a persistent legume component. It remains to be seen if we can get such a system on the Cicerone farmlets.

Stay tuned for more analysis of our results over coming months.

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## How are your 2004 drop lambs progressing?

Here are some facts and figures from the Cicerone farms. The lambs were marked in November, weaned in January and shorn in the last week of July.

Supplementary fodder has been put out to all lambs **from weaning** to help them cope with the drought conditions. During the six month time frame up to shearing each of the Farm A lambs received a total of 27.5 kg lupins, 4.8 kg maize and 17.6 kg of a maize:lupin [80:20] mix. Farm B and C lambs each received a total of 25.5 kg lupins and 15.3 kg of EzyFlow 1000.

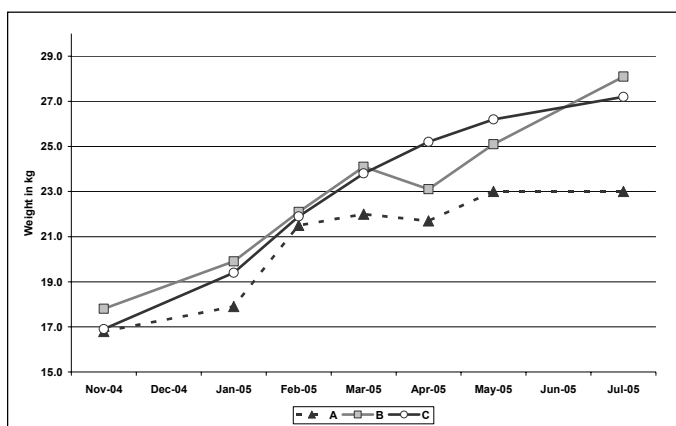
In the weeks post shearing the Farm A lambs were fed up to 4.6 kg per head per week of a Maize:Lupin mix 80:20 ration and the Farm B and C lambs each received Ezyflow 1000, the B's needing 2.8kg and the C's 2.7kg/hd/wk. The different rations account for the variability in available pasture, with the A paddocks having more short green feed and the B and C paddocks having more longer dry matter. At the end of September supplementary feeding ceased and lambs from all three farms weighed an average of 29kg.

Fig. 1 Average monthly weight of 2004 drop lambs from marking to shearing

A - - ▲ - -  
 B - ■ -  
 C - ○ -

It has been an expensive exercise to try to maintain some sort of growth for these future breeders and wool cutters. **But think what it would have cost us to replace them now. And come and look at the resulting magnificent pasture feed now available for the lactating ewes [Farm Walk - October 20<sup>th</sup>]**

How do your lambs and expenses compare?



	Farm A	Farm B	Farm C
\$ spent on fodder per head from weaning to 30 Sept	\$43	\$38	\$37
Average weekly gain from weaning to the July weighing	20.4g/hd/wk	32.8 g/hd/wk	31.2 g/hd/wk
Aug DSE per hectare	9.5	6.9	6.2
Number of lambs run	260	168	145
Average weight at Marking in Nov	16.8 kg	17.8 kg	16.9 kg
Average weight at Weaning in Jan	17.9 kg	19.9 kg	19.4 kg
Average weight prior to shearing in July	23.0 kg	28.1 kg	27.2 kg
\$ spent on drench per head [excl quarantine drench at shearing]	\$1.87	\$1.92	\$1.62
Average micron	16.1 μ	16.0 μ	15.9 μ
Average fleece weight	1.57 kg	1.75 kg	1.66 kg
Total fleece weight from farm	405 kg	302 kg	234 kg
Total kg 04 live wt walking round the farm prior to shearing	5948 kg	4697 kg	3971 kg

**2005-06 Membership Renewal**

Here is the membership form for the year Oct 05 to Oct 06 and I'd appreciate it if you could return it by 1<sup>st</sup> November 2005. **Please send to The Cicerone Project Inc, PO Box 1593, ARMIDALE 2350.**

Become a member of The Cicerone Project and receive lower entry fees to our seminars and keep up to date with the research on the three farmlets.

If each of you can encourage just one person to become a new member then we can reach our target membership set by AWI .... **This is a vital part of Cicerone's attempts to secure future funding**

TAX INVOICE

Membership renewal        **\$22 each (inc \$2 GST) if you introduce a new member**  
**OR \$33 (inc \$3 GST) ordinary renewal OR \$22 (inc \$2 GST) for students**



Membership Form

PLEASE PRINT

Name

.....

Address ..... Postcode.....

Email .....

Phone ..... Fax .....

INTRODUCED new member

Name

.....

Address ..... Postcode.....

Email .....

Phone ..... Fax .....

I have enclosed a cheque for \$ ..... for the annual membership fee for the above people

*The Cicerone Project Inc.*

*Trading as New England Cicerone Project*

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**Nomination for election to  
the Board of the Cicerone Project Inc.**

Nominees, proposers and seconders must all be current financial members of The Cicerone Project Inc.  
Nominations are to be sent to PO Box 1593, ARMIDALE 2350 or faxed to 02 6778 3872

**Closing date is 1 November 2005**

**NOMINATIONS**

Name of Nominee .....

Address ..... Phone .....

Signature of Nominee .....

Proposed by ..... Seconded by.....

**Name of Nominee** .....

Address ..... Phone .....

Signature of Nominee .....

Proposed by ..... Seconded by .....

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*The Cicerone Project Inc.*

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