

GenoSee Business Model

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2020-07-30

Executive Summary

Worldwide climate change and decrease in arable lands and lands under permanent crops constitute a major concern for future food safety. Private and government based breeding programs working constantly to develop elite crops in order to meet the future demand to feed 10 billion people by 2050. Under these constraints, to meet the rising demand for food, agricultural production must increase by an estimated 50% without greatly increasing water usage or expanding the total land area dedicated to agriculture. The era of data enable us to make processes highly efficient for companies and organisations. This is also true for the plant breeding industry, huge amount of data is recorded and collected - genotype, phenotype, environmental etc. Before inferring and analyzing the data, it should be transformed into findable, available, identifiable, reusable database. GenoSee is a one stop shop for all the breeding program associates which let them focus in achieving their goal - developing elite crops - while letting GenoSee handle the data related work. GenoSee estimate that it will reach 50 paying breeding programs worldwide during the next four years. We are asking for **\$1M** dollars for the first phase of development and **\$500K** for the second phase of development. Following our assumptions we calculate a potential positive **NPV**.

Assumptions

1. Thousands of open plant breeding programs worldwide.
2. Phase 1 - one year to MVP and reaching first customers.
3. Phase 2 - one year for improvement and growth.
4. We will look on the next 7 years.
5. Tax rate 38%.
6. Discount rate 12%.
7. Depreciation 4 years straight line.
8. During the next four years we will reach 50 breeding programs (to our opinion it is a conservative approach).
9. GenoSee will charge 15000 dollars for building the database and additional 300 dollars per user monthly.
10. GenoSee estimating average of 10 users per breeding program.

CAPEX Block

We will start by creating a depreciation matrix for the capital investment of the company. We will assume 4 years straight line depreciation that will taken into account only until it can be applied against taxable profit .

```
kHorizon<-7 # The model Horizon
year<-1:kHorizon # A sequence to represent the horizon years
kTaxRate<-38 # Tax percentage
kDiscountrate<-12 # Discount rate percentage per year for NPV calculations.
kDeprPer<-4 #month, the depreciation sheduale for the capital
p1.dur<-1 #Duration phase one in year
p2.dur<-1 #Duration phase 2 in year
p1.capex<-1000000 #Investment for phase 1.
```

```

p2.capex<-500000 #Investment phase 2.
maint.capex<-0 # Additional parameter nit used.
time.to.peak.sales<-3 #Time to reach 100 breedings programs.
mkt.demand<-50 # Market demand after 4 years.
phase <- (year <= p1.dur) * 1 +
(year > p1.dur & year <= (p1.dur + p2.dur)) * 2 +
(year > (p1.dur + p2.dur)) * 3
capex<-(phase==1)*p1.capex/p1.dur+(phase==2)*p2.capex/p2.dur+(phase==3)*maint.capex
depr.matrix <-
t(sapply(year, function(y)
ifelse(y <= p1.dur & year > 0,0,ifelse(
y == (p1.dur + 1) & year < y + kDeprPer & year >= y,
p1.capex / kDeprPer,
ifelse((year >= y) & (year < (y + kDeprPer)),
capex[y - 1] / kDeprPer, 0)
)
)
)
)
depr.matrix

```

```

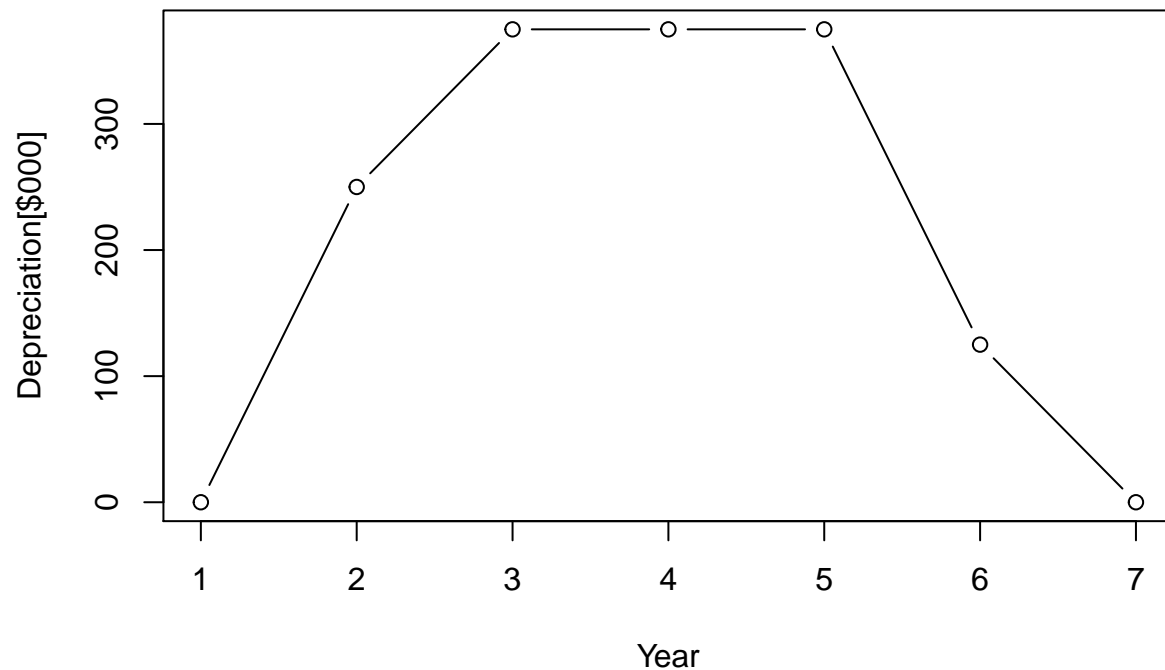
##      [,1]  [,2]  [,3]  [,4]  [,5]  [,6] [,7]
## [1,]    0     0     0     0     0     0   0
## [2,]    0 250000 250000 250000 250000     0   0
## [3,]    0     0 125000 125000 125000 125000   0
## [4,]    0     0     0     0     0     0   0
## [5,]    0     0     0     0     0     0   0
## [6,]    0     0     0     0     0     0   0
## [7,]    0     0     0     0     0     0   0

```

```

depr<-colSums(depr.matrix)
plot(year,depr/1e3,xlab="Year",ylab="Depreciation[$000]",type ="b" )

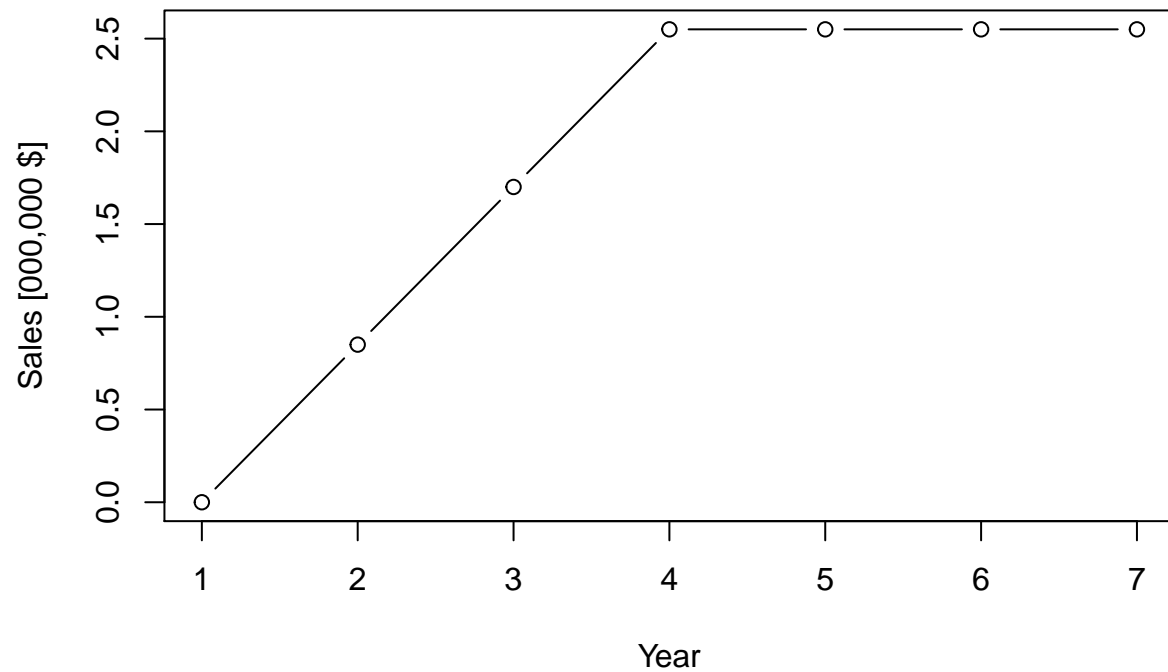
```



Sales and Revenue Block

We assume that it will take us 3 years after end of phase 1 to reach 100 breeding programs worldwide. We will price (assumption) the software to be 15000 dollars per year and additional subscription price per user of 300 dollars per month. We estimate that each program will have 5 users by average.

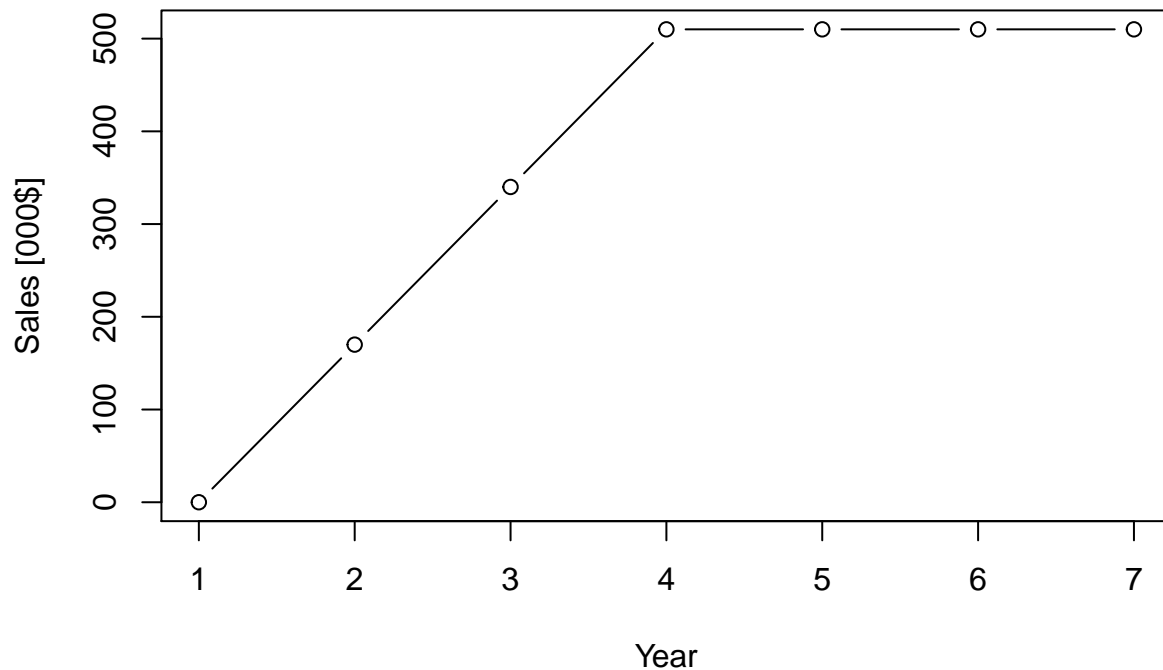
```
mkt.adoption<-pmin(cumsum(phase>1)/time.to.peak.sales,1)
price.per.software.year<-15000
price.per.user<-300
average.users.per.program<-10
month.per.year<-12
user.arr<-price.per.user*average.users.per.program*month.per.year
price<-price.per.software.year+user.arr
sales<-mkt.adoption*mkt.demand
revenue<-sales*price
plot(year, revenue/1000000,
     xlab = "Year",
     ylab = "Sales [000,000 $]",
     type = "b")
```



OPEX Block

The OPEX include R&D (research and development) and G&S (general sales and administrative) and is estimated to be 20% of the revenue. The operational cost will start only after phase 1.

```
opex<-revenue*0.2
plot(year, opex/1000,
      xlab = "Year",
      ylab = "Sales [000$]",
      type = "b")
```



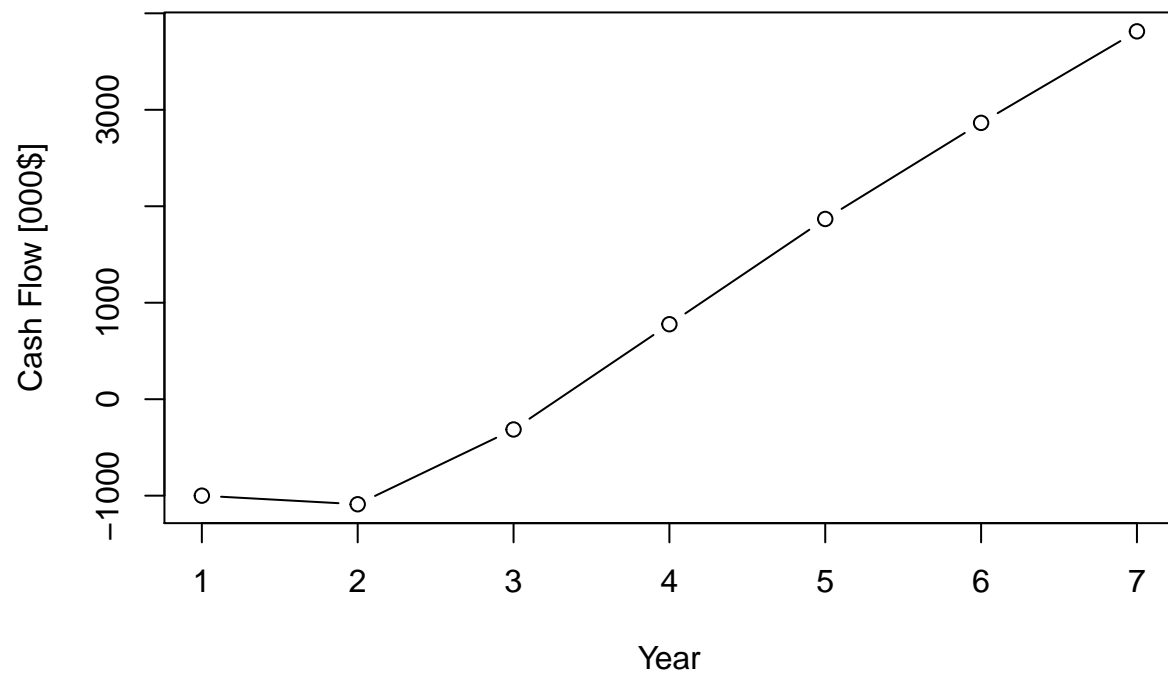
Pro Forma Table

- Gross profit = revenue-OPEX
- Operating profit before taxes = Gross profit - OPEX - depreciation
- Operating profit after tax = operating profit before tax-tax
- Cash flow = operating profit after tax + depreciation - CAPEX

```
gross.profit<-revenue-opex
op.profit.before.tax<-gross.profit-opex-depr
tax<-op.profit.before.tax*kTaxRate/100
op.profit.after.tax<-op.profit.before.tax-tax
cash.flow<-op.profit.after.tax+depr-capex
cum.cah.flow<-cumsum(cash.flow)
```

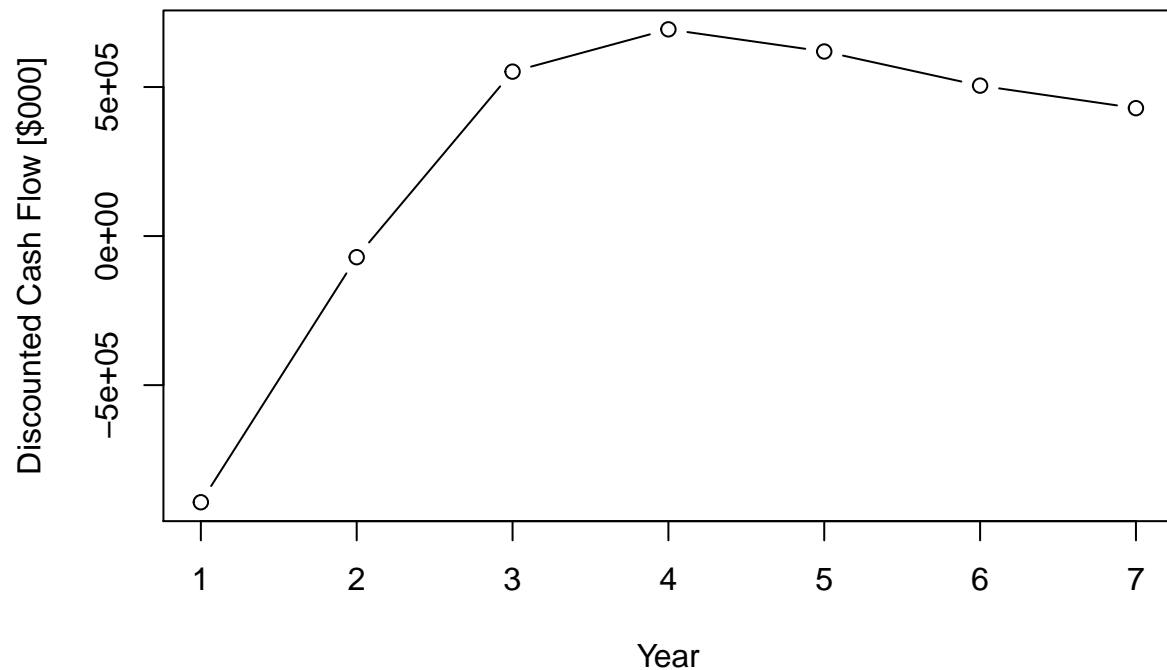
Cumulative Cash Flow

```
plot(year, cum.cah.flow/1000,xlab = "Year",ylab = "Cash Flow [000$]", type = "b")
```



Net Present Value

```
discount.factors <- 1/(1 + kDiscontrate / 100) ^ year
discounted.cash.flow <- cash.flow * discount.factors
plot(year,
      discounted.cash.flow,
      xlab = "Year",
      ylab = "Discounted Cash Flow [$000]",
      type = "b")
```



```
npv <- sum(discounted.cash.flow)
```

Net Present Value is 1.8341975×10^6

Pro Forma Table

```
pro.forma.vars <- array( c(sales, revenue, gross.profit,
-opex, -depr, op.profit.before.tax, -tax, op.profit.after.tax, depr, -capex, cash.flow ), dim = c(kHoriz
pro.forma <- data.frame(pro.forma.vars)
pro.forma.headers <- c("Sales [breeding programs]", "Revenue", "Gross Profit",
"OPEX", "-Depreciation", "Operating Profit Before Tax", "Tax", "Operating Profit After Tax", "+Deprecia
"Cash Flow")
colnames(pro.forma) <- pro.forma.headers
rownames(pro.forma) <- year
pro.forma = t(pro.forma)
pro.forma
```

##	1	2	3	4	5
## Sales [breeding programs]	0e+00	16.66667	33.33333	50	50
## Revenue	0e+00	850000.00000	1700000.00000	2550000	2550000
## Gross Profit	0e+00	680000.00000	1360000.00000	2040000	2040000
## OPEX	0e+00	-170000.00000	-340000.00000	-510000	-510000
## -Depreciation	0e+00	-250000.00000	-375000.00000	-375000	-375000
## Operating Profit Before Tax	0e+00	260000.00000	645000.00000	1155000	1155000
## Tax	0e+00	-98800.00000	-245100.00000	-438900	-438900
## Operating Profit After Tax	0e+00	161200.00000	399900.00000	716100	716100

## +Depreciation	0e+00	250000.00000	375000.00000	375000	375000
## CAPEX	-1e+06	-500000.00000	0.00000	0	0
## Cash Flow	-1e+06	-88800.00000	774900.00000	1091100	1091100
##	6	7			
## Sales [breeding programs]	50	50			
## Revenue	2550000	2550000			
## Gross Profit	2040000	2040000			
## OPEX	-510000	-510000			
## -Depreciation	-125000	0			
## Operating Profit Before Tax	1405000	1530000			
## Tax	-533900	-581400			
## Operating Profit After Tax	871100	948600			
## +Depreciation	125000	0			
## CAPEX	0	0			
## Cash Flow	996100	948600			

References

The business model in this post based on a book by Robert D. Brown III *Business Case Analysis with R**