

Dryland farming defined

DRYLAND-FARMING, is the **profitable** production of useful crops, without irrigation, on lands that receive annually a rainfall of 20 inches or less. From my experience as a farmer it is still dry-land farming even when it is not profitable.

Problems of Dryland farming – use of rainfall

Dryland-farming, however, always implies farming under comparatively small annual rainfall availability. More importantly, it is generally the rainfall that falls in the growing season April to October that determines the final yield.

Water is a limiting factor in production, along with the nature of the soil with its power to receive and retain the water from rain. Only the water, safely stored in the soil within reach of the roots, can be used in crop production. Most areas can produce above average crops from below average rainfall providing it falls at the right time. Generally good spring rains usually make or break the harvest. The Mallee area has a clay sub-soil that holds the moisture near the surface for longer than regions with a porous soil.

During the growing season, water may be lost by downward drainage, by evaporation from the surface and the growth of weeds.

Even with sufficient rainfall productive crops can be affected by other conditions. A frost in the October period or a hot north-wind can both wreak havoc on a promising crop: not forgetting the devastation caused by a mouse plague.

Diseases

Cereal plants are subject to the ravages of numerous diseases which interfere with the growth and yield of the crops, and are responsible for losses amounting to hundreds of millions of dollars annually. Some of these diseases are controlled to a certain extent by cultural practices, by the use of preventive measures such as spraying, or treatment of the seed prior to sowing, but there are others in which all preventive treatment fails. In cases such as these our plant breeders have achieved tremendous success by making available resistant varieties.

Breeding of varieties

The Australian wheat fields have been considerably extended because of the success of our wheat breeders in propagating earlier maturing varieties.

Wheat is normally self-fertilized, and it is to the cross-breeding and scientific work done by our plant breeders that such excellent wheats have been obtained.

There are three ways to improve quality –

1. Imported grain from other countries
2. Selected plants from a crop
3. By cross-breeding from other varieties.

William Farrer, in 1886 began to practise his theory that wheat varieties could be improved by cross-breeding. The methods he pioneered have been followed with conspicuous success by later plant breeders. It has been stated that with the Federation variety the wheat belt was considerably extended into the drier districts, where success was dependent on the growing, of early maturing varieties. In this great agricultural continent with its sportspeople, politicians, governors, wool-kings and entrepreneurs, it has been said that Farrer, as an individual, provided more material wealth to Australia than most.

South Australian Wheat Breeders.

Pioneer South Australians have made major contributions to the cereal agricultural development in plant-breeding, soil enhancement, inventions and manufacturing of equipment.

For many years any advancement made was due to the keenness of farmers in observing outstanding plants in their crops, sowing the seed from the selected heads, and thus producing varieties and strains superior to those being grown. This is less likely to occur these days because of the area sown and the speed that the crop is harvested.

In 1881 Dr Richard Schomburgk, the Director of the Adelaide Botanical Gardens imported grain from South Africa and distributed it to farmers in various areas of the State. James Ward of Nelshaby, noticed most of the crop was as 'rusty as horse shoe nails – except for a few heads.' Sowing that selected grain he obtained 11lb the first year, 50lbs the second year, 7 bags the third year, and 233 bags the fourth year (10 bag crop). The selection became known as Ward's Prolific. Because of its rust resistance and ability to yield under low rainfall, it soon became the most widely grown variety in South Australia.

In 1884 August Steinwedel of Dalkey had a crop with most of it about 13" high. There were a few stalks 5' high. It wouldn't take much observation to notice the difference in height. Growing so well, it also had drought resistant qualities, making it a good proposition for hay and more grain in a dry year. Between 1890 -1910 Steinwedel was very popular throughout Australia and remained a top variety in New South Wales up to 1925.

In 1890, Ward's Prolific, came under the notice of Richard Marshall, Wasleys, who produced the variety Marshall's No. 3 at the same time that Federation was produced. Personally I believe Richard Marshall has

not received the recognition and credit that he is worthy of.

By 1910 it became one of the most popular wheats in Australia and maintained its popularity in New South Wales up to 1935. Marshall had even more success with the variety Yandilla King. By 1915, Yandilla King stood next to Federation as the most popular wheat in Australia. I believe Marshall's contribution to the grain grower has not been fully recognized and valued.

1894 Henry Gluyas of Port Germain selected 8 or 9 types from Ward's Prolific that yielded well under dry conditions. This variety, Gluyas, was very popular from 1910-25.

These early South Australian varieties were important in the breeding of other prominent varieties.

The breeding of better wheat varieties is only the first step in their general acceptance by farmers. Numerous trials are conducted on experimental farms and finally, on the properties of interested farmers. By conducting these district trials the agronomists and public spirited wheat growers form important links in the improvement of wheat growing in each region.

Usually it takes ten years from the time the cross is made until its release. This time is required to fix the line (or make it pure), and to test it. If a variety can be secured with desirable characteristics, the ability to yield and resistance to diseases, then the element of risk has been minimized to a large extent.

Most varieties have been, important, either because of their value as commercial varieties or in some instances as parents in cross-breeding.

Without the release of high-yielding, early maturing strong-strawed and disease-resistant varieties, the full benefit of these improvements would not have been realised.

Yield is always the most important character. No one variety is best under all conditions, but climate, soil, and the purpose for which wheat is grown must in each case determine which variety is most profitable.

Varieties are recommended for each zone of the State for capability for yield and quality. Other varieties may incur a penalty.

Other South Australian Contributions

South Australia was at the forefront of early mechanical inventions. Being blessed with good farming land this state moved into cereal production for both economic and geographic reasons.

In 1840 much of that harvest was lost due to early ripening and shattering of the grain, and it became obvious to grain growers that an alternative to the labour-intensive sickle and scythe was urgently needed.

Shortage of labour in the early years brought another crisis, this time for the cereal farmers, who had no men to cut and gather the wheat crop of 1842. South Australian farmers faced the prospect of being unable to harvest a bountiful wheat crop.

Unless a mechanical alternative was available, a large proportion of the crop would be wasted.

Mechanisation of the industry increased with South Australian inventions such as the Mullins scrub roller, Ridley stripper and the Smith stump jump plough.

Improvements to the Ridley Stripper

In 1884, Walter Paterson made improvements to the basic stripper design by putting the horses in front of the machine, and providing a seat for the operator. Another significant change was the crown wheel teeth and pinion gear being put to the inside of the crown wheel. By doing so, the fly wheel pulley turned in the opposite direction, so the belt could link to the beater pulley belt without being crossed.

Impact of the Stripper

By 1850, there were 200 strippers in operation, and the number exploded to 14,000 by 1880. In 1861, 70% of South Australia's crop was harvested by stripper, compared to Victoria's 7%. To fully understand the impact of the stripper on South Australia's wheat production, the figures for 1876 show that over one million acres were sown in South Australia and 610,000 acres for the rest of Australia.

An immigrant to South Australia, John Bagshaw, designed and built hand winnowers from 1838. Other early and long-established machinery manufacturers were David and John Shearer, and Joseph Horwood and others.

The use of superphosphate introduced by Roseworthy Agricultural Principals John Custance and William Lowry and dry-farming techniques have contributed greatly to the measure of success achieved. Custance recommended not more than three hundredweight per acre whilst his successor Lowry suggested one and a half to two hundredweight per acre drilled in with the seed.

Horses

The most popular farm horse was the Clydesdale. Often called “the gentle giant” they were an intelligent animal renowned for their docile nature with a robust constitution, physical strength, enormous muscular energy and endurance under demanding conditions. With horses a considerable part of the crop had to be cut for hay to feed the horses. It was estimated that it took five tonne of food per horse for a year.

They needed care all year as the farmer never knew when it would rain and the need to be ready to work the land.

A farmer needed to spend about four hours attending to the horses for 8 or 9 hours work. Just after WWI it was estimated that in Australia there was one horse for every person – a population of about 5,000,000 people. Railway sidings were situated so that most farmers could get from the farm to siding and home in a day. Our property was six miles from Pinnaroo and Dad said he was able to make three trips in two days.

Early harvest equipment relied on ground drive traction to power the machinery.

Peter Peers, a local engineer from Murrayville, now a 98 year old, recently said that his greatest achievement ‘was designing, patenting and manufacturing the Turning Box Power Take Off for farm machinery’. He obtained power from the tractor through a converted Ford car differential to the header-harvester. This enabled the machine to operate at a constant speed but the operator was able to change the ground speed of the tractor through its gears.

I always heard it referred to as a PTO – not sure if it was Power Take Off or Peers Take Off. My father worked property at Pinnaroo and Brim in Victoria and whenever he was going to Brim with the truck usually took some PTO’s to towns along the way.

Tractors

Tractors, particularly with the introduction of rubber tyres meant better traction and bigger and better equipment. Improvements such as hydraulics, cabins, air-conditioners, radio (and even DVDs) and computer equipment such as the GPS (Global Positioning System). Technological advancements are still ongoing, computers record the yield of the crop as it is being harvested which in turn adjusts the amount of fertiliser applied when sowing the crop. With sowing spacings of say 30cms apart the next year they are able to sow between the rows of the previous sowing.

The early conventional method, including fallowing, meant much working of the land to kill the weeds. It also meant soil erosion in many cases. Some advice was “If you have nothing else worthwhile to do ‘harrow.’ Continuous working often fined the soil and exposed it to the winds. A later comment ‘I would like to take all the harrows and dump them in the creek.’ Today, we would of course dispose of them by recycling. Later chemicals enabled the weeds to be killed without so much working of the soil. Spraying enabled in many cases to eliminate or severely restrict such weeds as barley grass, rye grass, saffron thistles, turnip and mustard weed.

Today minimum, no-till or direct drill, using narrow points or tynes, enable the seed to be sown into undisturbed soil. The weeds being sprayed out prior to seeding. Certainly in the Mallee over the past few years the direct drilled crops have been the higher yielding ones. There is a machinery upgrade cost and the benefit may not be noticed for a few seasons.

Bulk

My father in presenting a paper at the Agricultural Bureau Pinnaroo Line Conference in 1951 said' "I have come to the conclusion that the bag handling of wheat, as we do it here in South Australia, is a very laborious, wasteful and antiquated method of handling wheat."

A bag of 90 kilograms would be handled a minimum of 10 times from crop to miller.

He was influenced by a Victorian relative, who as a Member of Parliament, toured America researching bulk handling of grain. Our proximity to Victoria made it possible for us to be among the first in South Australia to deliver our 1951-52 harvest in bulk. We, including my brothers, started using bulk seeding in 1957.

Quality

The farmer looks for high yields. The miller looks for quality wheat that gives a high yield of good coloured flour, preferably of good baking quality. The baker prefers to acquire a uniform flour which will produce the largest number of loaves per bag of flour with the minimum of trouble. The millers mix Mallee wheats with Wimmera grown wheat to get the right blend of flour. The Mallee country generally produces a higher protein wheat compared with Wimmera grown wheat. The merchant is prepared "to make dough too" if he can purchase high quality wheats from the farmer without paying an adequate premium per tonne to compensate for the reduced yield, as unfortunately, high yields and high quality are incompatible and cannot be combined. Crops tend to have a higher protein content in a dry season – lower yield.

It appears that quality in wheat is to a large extent influenced by various factors, such as environment, soil fertility, seasonal conditions during the growing period, and to the climatic elements during the ripening and harvesting of the crop.

I recently read in a National Geographic (June 2009 issue) that today six billion people rely on just 11% of the earth's land surface. In the September 2008 National Geographic, it stated that by the year 2030, 8.3 billion people will walk the earth and farmers will have to grow 30% more grain.

GIVE US OUR DAILY BREAD

One tonne of wheat produces about 700 kilogrammes of flour that makes about 1400 loaves of bread. Taken further, and I am aware statistics are like a bikini. What they reveal is interesting what they conceal is vital.

One tonne of wheat (\$300) produces 700 kilogrammes flour (\$520) 7000 plus sale of 300 kilogrammes of bran, pollard etc. The 1400 loaves of bread at \$3.00 a loaf is \$4,200.

Percentages taken from a 1990 calculation applied to today's bread prices – \$3.00 loaf - Farmer 46 cents (29 cents production costs), miller 53 cents, baker \$1.27 and the retailer 74 cents.

In preparing this paper I was looking through a Department of Agriculture book and came across a poem submitted by a Mr B A Simmonds of Kadina.

THE FARMER FEEDS THEM ALL

The politician talks and talks
The actor plays his part
The soldier glitters on parade
The painter creates his art
The scientist pursues his germs
O'er this terrestrial ball
The sailor navigates the ship
But the farmer feeds them all

The teacher trains the youthful mind
The broker reads the tape
The tailor cuts and sews the cloth
To fit the human shape
The dame of fashion dressed in silk
Comes forth to drive or call
To ride or dance or promenade
But the farmer feeds them all

The workman wields his shining tools
The merchant shows his wares
The astronaut above the clouds
A dizzy journey dares
BUT ART AND SCIENCE SOON WOULD FADE
AND COMMERCE DEAD WOULD FALL
IF THE FARMER CEASED TO REAP AND SOW
FOR THE FARMER FEEDS THEM ALL

(B. A. Simmonds, 1 February 1977) Kadina

Molineux, Krichauff, Davenport, Horn, Homburg, Schomburgk, Brown, Lowrie, Kelly

WHEAT BREEDING and VARIETIES in Australia SL MACINDOE and C Walkden BROWN

THE WHEAT INDUSTRY IN AUSTRALIA by AR CALLAGHAN and AJ MILLINGTON

How the many varieties of wheat in Australia get their names.

In NSW, for example, the varieties are named after birds, hence such variety names as Heron, Falcon, Raven, Eagle, Kite and Egret.

During the past 30 years, the varieties bred at SA's Roseworthy Agricultural College have been named after bladed weapons, such as Sword, Javelin, Dirk, Scimitar, Sabre and Halberd.

In WA, the varieties are named after WA towns, such as Bencubbin, Bungulla, Merredin, Nabawa, Narrogin.

The Victorian varieties suggest heights, such as Pinnacle, Summit, Sherpa, Beacon. Olympic was released in 1956 when the Olympic Games were held in Melbourne.

The Waite Agricultural Research Institute in Adelaide, (WARI), has produced such varieties as Warigo, Seewari, Glenwari, and Warimba. (Warigo is well named, coming from the first letters of the Waite Agricultural Research Institute, Glen Osmond. "Warigo", released in 1942, was the first fully immune rust resistant wheat to be released for commercial planting in South Australia.

South Australia Dry

South Australia Dry was a project undertaken in 2001 as part of celebrations for the Centenary of Federation. The *South Australia Dry* project produced six exhibitions exploring the theme of how people in South Australian dry land areas have managed scarce water resources, and the impact that the lack of water has had on the development of communities and farming practices in the State since Federation. The project was coordinated by the History Trust and funded by the Centenary of Federation. The participating museums. Kimba, Melrose, Kadina, Lameroo and Pinnaroo close to Goyder's Line. Waite.

Part of our SA Dry project mentions 'Conserve the moisture – conserve the soil' He did not see the area between the Murray and the SA-Vic border. Originally south of Pinnaroo now about 40 kms north.

The Farmer Feeds Them All

The Farmer Feeds Them All

The king may rule o'er land and sea
The lord may live right royally
The soldier rides in pomp and pride
But the farmer feeds them all

The farmer feeds them all
The farmer feeds them all
The busy farmer feeds them all
The farmer feeds them all
The farmer feeds them all
The busy farmer feeds them all

The writer thinks, the poet sings
The craftsman fashions wondrous things
The doctor heals, the lawyer pleads
But the farmer feeds them all

The merchant he may buy and sell
The teacher do his duty well
But men may toil through busy days
But the farmer feeds them all

The farmer's trade is one of worth
He's partner with the sky and earth
He's partner with the sun and rain
And he feeds, he feeds them all

words by Jonathan R. Bryant
tune by Lillie E. Barr
SOF

Oh the lawyer hangs around
While the butcher cuts a pound,

But the farmer is the man who feeds them all;
And the preacher and the cook
Go a-strolling by the brook,
But the farmer is the man who feeds them all.

The farmer is the man, (twice)
Lives on credit till the fall;
With the interest rate so high,
It's a wonder he don't die,
For the mortgage man's the man who gets it all.

When the banker says he broke
And the merchant's up in smoke,
They forget that it's the farmer feeds them all.
It would put them to the test
If the farmer took a rest,
Then they'd know that it's the farmer feeds them all.