

show that when a dense covering is formed it so protects the soil that little evaporation takes place in the late fall and the ground by fall will actually contain more moisture than the areas not so covered. Winter killing of the root is more liable to occur in a dry soil. This is not of special consideration in northern sections only, for winter killing is often caused by alternate freezing and thawing, which has a greater range in a somewhat dry soil than in a moist soil, for the more water a soil contains the less liable is it to frequent alternate freezing and thawing.

Cover crops were first used for the purpose of keeping frost from penetrating the ground and at the same time prevent alternate freezing and thawing. It will prevent the latter as we all know from experience, and experiments go to show that a moderate mulch on the surface will keep the frost from penetrating less than half the depth that it will on unprotected areas. The frost penetrating the soil may not prove injurious, but alternate freezing and thawing must be guarded against.

#### PLOWING UNDER NOT ADVOCATED

It is usually not advisable to plow under a cover crop in the fall. There is much less liability to washing off the surface soil, and the mulching effect is better if it is on the surface. It also serves to hold the snow, which is one of the best protective covers we can have.

Personally, I think it does not matter whether the cover crop stands the winter or not. In fact the only advantage that I can see in having one that will stand the winter is to dry out the ground early the following spring. The danger, however, is that we may allow them to grow too long before plowing under and rob the ground of much moisture that might have been conserved, and as well deprive the tree of its full early spring breakfast.

The following experiments which I personally conducted show the effect of winter rye and Red clover in reducing the moisture contents of the soil as compared with the early cultivated crimson clover plot. A plot of oats sown on an adjoining plot on June 20th was also compared

as to the percentage of moistures at different dates. These plots showed how quickly the moisture contents of the soil can be reduced by crops in the orchard in the spring and early summer months.

Date Samples were taken	Winter Rye	Date sown	Crimson Clover plowed under	Red Clover plowed
May 12 . . .	18.41	June 20	May 13	18.93
May 26 . . .	17.21	18.02	20.88	18.97
June 9 . . .	12.52	17.84	21.21	14.04
June 23 . . .	10.46	17.40	20.31	11.65
July 7 . . .	9.06	16.70	20.46	11.22
July 21 . . .	7.46	13.43	19.14	12.06
Aug. 4 . . .	8.23	9.49	20.54	10.36
Aug. 18 . . .	9.80	10.30	18.11	13.66
Sept. 6 . . .	17.79	16.99	20.26	20.22
Sept. 20 . . .	14.91	16.31	24.04	19.87
Oct. 31 . . .	21.33	19.77	18.09	19.71
			26.02	

The clover plot was given clean culture and no cover crop was used on any of these plots. The fall was a moderately wet one and these plots each contained approximately twenty per cent. of moisture, which amount our experiments indicate is about right for the most successful wintering of the tree. One of the bad effects of drying out the soil early in the spring is that the subsoil water is lost, whereas it should be retained for the crop later on, as it is this water on which the crop depends later in the season. The tabulated data shows only the condition of the soil to one foot in depth, but soil to a greater depth would show as great a variation.

It is advisable, except in cases where the ground has an excess of nitrogen, to use leguminous cover crops. The Crimson clover and common vetch we prefer. Both of these make an ideal cover. The math is not objectionable at picking time and it forms a good protective covering.

We find that the clover can be worked under with greater ease and for that reason we use it principally. The two mixed together are good.

Red clover does not make sufficiently rapid growth in my opinion and we do not use it except in our comparative tests. We get a much better protective covering with the crimson clover, and a very much greater bulk of material to turn under. A mistake is often made in using too little seed. Never use less than twenty-five pounds of Crimson clover and seventy-five pounds of vetch seed per acre.

#### SEEDING CLOVER

In seeding to clover we run over the ground with a tilting spike tooth harrow, sow the seed and harrow with this tool again having the teeth upright, and again harrow with the teeth tilted to leave a perfectly smooth surface. The seed can be safely worked in to a greater depth than is the case with the smaller Red clover seed. In seeding vetch I prefer to use the springtooth harrow which leaves the soil more in ridges and after seeding this is again used, followed by the leveling harrow.

I have never yet had any difficulty in getting a good catch from seeding on a properly cultivated area. If this ground is thoroughly dried out on the surface, there may be trouble, but in such cases I would advise working in the seed more deeply.

One of the best of the Japanese plums for long distance shipping is Ogon.



A View of a Portion of the Display of Apples at the Recent Exhibition at St. John, N.B.